CURTIS'S

BOTANICAL MAGAZINE,

ILLUSTRATING AND DESCRIBING

Plants of the Royal Botanic Gardens of Kew,

AND OF OTHER BOTANICAL ESTABLISHMENTS;

EDITED BY

SIR DAVID PRAIN, C.M.G., C.I.E., LL.D., F.R.S.,
DIRECTOR, ROYAL BOTANIC GARDENS, KEW.

VOL. XII.

OF THE FOURTH SERIES.

(Or Vol. CXLII. of the Whole Work.)

"Disposing well
The gay diversities of leaf and flower."
COWPER.

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To

SIR WILLIAM TURNER THISELTON-DYER,

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LATELY EDITOR OF THE

BOTANICAL MAGAZINE,

THE VALUE OF WHICH HE HAS SINCE

FURTHER ENHANCED

BY THE CONTRIBUTION TO ITS PAGES

OF SUBJECTS FROM HIS GARDEN

AT THE FERNS, WITCOMBE,

THIS VOLUME

IS GRATEFULLY DEDICATED.

Kew, December 1, 1916.

INDEX

To Vol. XII. of the Fourth Series, or Vol. CXLII. of the whole Work.

8691 Abies cephalonica.
8678 Acacallis cyanea.
8658 Alnus cordata
8663 Aloe arborescens, *var.* natalensis.
8651 Alpinia Elwesii.
8653 Androsace coccinea.
8650 Aristolochia Lawrenceae.
8687 Artanema longifolium
8670 Brachystelma oianthum.
8682 Callicarpa Giraldiana.
8666 Campanula Zoysii.
8652 Chamaedorea nana.
8644 Chrysanthemum foeniculaceum.
8668 Cirrhopetalum concinnum, *var.* purpurea.
8686 Clematis afoliata.
8655 „ Pavoliniana.
8685 Cytisus monspessulanus.
8661 „ ratisbonensis.
8683 Dendrobium Palpebrae.
8642 Eria ornata.
8662 „ tomentosa.
8646 Eucharis Lowii.
8656 Euonymus Bungeanus.
8673 Euphorbia Caput-Medusae.
8645 Funkia lancifolia, *var.* tardiflora.
8689 Huntleya citrina.
8648 Lobelia Holstii.
8677 Lonicera tatarica.
8657 Lupinus Chamissonis.
8674A Mesembryanthemum transvaalense.
8674B Mesembryanthemum tuberculosum.
8667 Paeonia Willmottiae.
8671 Pandanus furcatus.
8660 Pentstemon rupicola.
8665 Rhododendron charianthum.
8659 „ decorum.
8643 „ erubescens.
8669 „ Hanceanum.
8649 „ hypoglaucum.
8675 „ monosematum.
8688 Rosa cerasocarpa.
8679 „ Davidii.
8690 Sanguisorba obtusa, *var.* amoena.
8664 Saxegothaea conspicua.
8647 Sophora macrocarpa.
8654 Sophrolaelia Psyche.
8681 Stapelia Gettleffii.
8684 Telopea oreades.
8680 Thuranthos macranthum.
8676 Ursinia cakilefolia.
8672 Viburnum betulifolium.

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BOTANICAL MAGAZINE.

CONTENTS OF No. 133, JANUARY, 1916.

TAB. 8642.—ERIA ORNATA.

„ 8643.—RHODODENDRON ERUBESCENS.

„ 8644.—CHRYSANTHEMUM FOENICULACEUM.

„ 8645.—FUNKIA LANCIFOLIA, *var.* TARDIFLORA.

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Tab. 8642.

ERIA ornata.

Malaya.

Orchidaceae. Tribe Epidendreae.

Eria, *Lindl.*; *Benth. et Hook. f. Gen. Plant.* vol. iii. p. 509.

Eria (§ Dendrolirium) **ornata**, *Lindl. Gen. and Sp. Orch.* p. 66; *De Vriese, Ill. Orch.* t. 8; *Miq. Fl. Ind. Bat.* vol. iii. p. 660 partim; *Ridl. in Journ. Linn. Soc.* vol. xxxii. p. 302; *J. J. Smith, Orch. Jav.* p. 380 partim, fig. 288; *Kraenzl. in Engl. Pflanzenr., Orch.-Dendrob.* pars 2, p. 50 pro parte sed fig. excl.; species distincta, ab *E. armeniaca*, Lindl., bracteis basi latioribus aurantiacis et labelli disco tricarinato differt.

Herba epiphytica, rhizomate crasso lignoso. *Pseudobulbi* distantes, late ovoidei vel ovoideo-oblongi, subcompressi, 4–7 cm. longi, triphylli. *Folia* breve petiolata, elliptico-oblonga, subacuta, coriacea, recurva, 20–25 cm. longa, 4–5 cm. lata. *Scapi* suberecti, 30–45 cm. longi, basi vaginis sat numerosis imbricatis vestiti, tomentosi praesertim superne, multiflori; bracteae magnae, ovatae vel ovato-lanceolatae, subobtusae, margine paullo reflexae, 3–4·5 cm. longae, glabrae vel parce pubescentes, pulchre rubro-aurantiacae; pedicelli 3–4 cm. longi, tomentosi. *Flores* mediocres, extra brunneo-tomentosi. *Sepala* subconniventia; posticum ovato-oblongum, subobtusum, 1·2–1·5 cm. longum; lateralia subaequalia basi valde dilatata, mentum breve rotundatum formantia. *Petala* lineari-oblonga, 1–1·2 cm. longa. *Labellum* recurvum, trilobum, 1–1·2 cm. longum, basi angustum; lobus intermedius deltoideo-ovatus, subobtusus, undulatus; lobi laterales late triangulares, obtusi; discus tricarinatus. *Columna* clavata, 5 mm. longa. *Pollinia* 8, ellipsoidea.—*Dendrolirium ornatum*, Blume, Bijdr. p. 345.—R. A. Rolfe.

The striking *Eria* here described has had a somewhat confused history. It was originally published as *Dendrolirium ornatum* in 1825 by Blume, who based his species on material from Bantam and from Buitenzorg in Java. It became, therefore, *E. ornata* when Lindley treated Blume's genus as a section of *Eria*. Some time thereafter Lindley described, as *E. armeniaca*, a Philippine *Eria* collected by Cuming which had flowered in the collection of Messrs. Loddiges at Hackney. Later, however, Lindley included the Philippine *E. armeniaca* in the older *E. ornata*, and at the same time added to the species a Khasia plant collected by Sir Joseph Hooker. The Khasia plant is now known to be a distinct species, *E. tomentosa*, Hook. f.; the status of the Philippine one is less clear, for Kränzlin follows Lindley's later view and treats *E. armeniaca* as a form of *E. ornata*, while Ridley adopts that originally formed by Lindley. The two plants are

certainly very closely allied, but in the Philippine one the bracts are narrower at the base than they are in *E. ornata*, and yellow rather than orange, while the lip is somewhat different in shape. On this account, and also because of the occurrence of another nearly allied but equally distinct species, *E. hainanensis*, Rolfe, in the island of Hainan, it is preferable to adopt Ridley's view. The original *E. ornata* now figured occurs in Sumatra and Borneo as well as in Java, and has been also met with by Curtis at Pungah in Siam. The plant figured is the one from Borneo, which was presented to Kew in May, 1915, by Mr. H. J. Elwes, Colesborne, Cheltenham; it thrives well in a tropical house under the conditions suitable for Malayan species of *Dendrobium* and *Eria*. The more striking features of *E. ornata* are its robust habit, its large rather coriaceous leaves, its large reddish-orange bracts and its densely tomentose brownish-grey flowers.

DESCRIPTION.—*Herb*, epiphytic; rhizome stout, woody; pseudobulbs discrete, wide-ovoid or ovoid-oblong, somewhat compressed, $1\frac{1}{2}$–$2\frac{3}{4}$ in. long, three-leaved. *Leaves* shortly petioled, elliptic-oblong, rather acute, coriaceous, recurved, 8–10 in. long, $1\frac{1}{2}$–2 in. wide. *Scapes* rather erect, 1–$1\frac{1}{2}$ ft. long, clothed at the base with a number of imbricate sheaths, tomentose especially towards the top, many-flowered; bracts large, ovate or ovate-lanceolate, rather obtuse, slightly reflexed along the edge, $1\frac{1}{4}$–$1\frac{3}{4}$ in. long, glabrous or sparingly pubescent, bright reddish-orange; pedicels $1\frac{1}{4}$–$1\frac{1}{2}$ in. long, tomentose. *Flowers* medium-sized, brown-tomentose outside. *Sepals* somewhat connivent; the posterior ovate-oblong, somewhat obtuse, $\frac{1}{2}$–$\frac{3}{5}$ in. long; lateral about as large but much dilated at the base where they form a short rounded mentum. *Petals* linear-oblong, $\frac{1}{2}$ in. long or rather less. *Lip* recurved, 3-lobed, $\frac{1}{2}$ in. long or rather less, narrowed at the base; middle-lobe deltoid-ovate, rather obtuse, with undulate margin; lateral lobes wide-triangular, obtuse; disk 3-keeled. *Column* clavate, $\frac{1}{5}$ in. long. *Pollinia* 8, ellipsoid.

Fig. 1, flower; 2, petal; 3, lip; 4, column; 5, anther-cap; 6, pollinia; 7, sketch of an entire plant:—*all enlarged except* 7, *which is much reduced.*

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Tab. 8643.

RHODODENDRON erubescens.

Western China.

Ericaceae. Tribe Rhodoreae.

Rhododendron, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. ii. p. 599.

Rhododendron (§ Eurhododendron) **erubescens**, *Hutchinson*; species nova, affinis *R. Fargesii*, Franch., sed foliis conspicue reticulatis, filamentis dense pubescentibus differt.

Frutex; ramuli stricti, cortice purpureo glabro obtecti. *Folia* oblongo-elliptica, apice obtuse et abrupte mucronata, basi obtusa vel rotundata, 8–10 cm. longa, 3–4 cm. lata, rigide coriacea, supra atro-viridia, impresso-reticulata, infra flavo-viridia, minute papillosa, eglandulosa; costa media supra leviter impressa, infra prominens, apicem laminae versus sensim angustata; nervi laterales utrinsecus circiter 12, pergraciles, flexuosi, supra leviter impressi, infra vix prominentes; veni infra graciliter reticulati; petioli robusti, 2 cm. longi, supra canaliculati, carmineo-purpurei, sicco transverse verrucosi, glabri. *Flores* terminales, circiter 8-nati; pedicelli 1–1·4 cm. longi, breviter sed dense papilloso-glandulosi. *Bracteae* extra adpresse villosae. *Calyx* parvus, 5-lobus, lobis inaequalibus ovato-rotundatis ad 2 mm. longis papilloso-glandulosis. *Corolla* intus alba, extra roseo-carminea; tubus late turbinatus, circiter 3 cm. longus, apice circiter 2·5 cm. diametro, intus basin versus minute puberulus; limbus 5·5 cm. expansus, 7-lobus, lobis patulo-recurvatis semiorbicularibus emarginatis 1·3 cm. longis et latis. *Stamina* inclusa, 12–14; filamenta ad 2 cm. longa, inferne dense pubescentia; antherae purpureae, 2·5 mm. longae. *Ovarium* glandulis albis stipitatis ornatum, plerumque 6-loculare, 5 mm. longum; stylus exsertus, glaber, 3 cm. longus, stigmate viscido pallide flavo 2·5 mm. lato coronatus.—J. Hutchinson.

The beautiful Chinese Rhododendron now figured is one of a group of some forty closely allied species belonging to the section *Eurhododendron*, all of them characterised by their glabrous and eglandular leaves. Several other Chinese members of this group are now in cultivation, the more notable being *R. Fortunei*, Lindl., figured at t. 5596 and *R. Souliei*, Franch., figured at t. 8622 of this work; in our collections may also be found *R. discolor*, Franch., *R. Fargesii*, Franch., and *R. orbiculare*, Franch. The nearest affinity of *R. erubescens* is with *R. Fargesii*; from that species our plant appears to differ mainly in the more distinctly reticulate leaves and in having hairy filaments, those of *R. Fargesii* being quite glabrous. The material for our plate has been

derived from a plant obtained from Messrs. J. Veitch & Sons for the Kew collection in 1908. The species was introduced by means of seed obtained for Messrs. Veitch by Mr. E. H. Wilson during his first journey to China on their behalf. The plant itself is quite hardy, but at Kew the flowers, which open about the middle of April, are apt to be injured by late frosts. It thrives in either a peaty soil or a sandy loam enriched by leaf-mould.

DESCRIPTION.—*Shrub*; twigs rigid, clothed with purple smooth bark. *Leaves* oblong-elliptic, suddenly bluntly mucronate, obtuse or rounded at the base, 3–4 in. long, $1\frac{1}{2}$–$1\frac{3}{4}$ in. wide, firmly coriaceous, dark green above with impressed reticulation, beneath yellowish-green, finely papillose, eglandular; midrib slightly sunk above, raised beneath and gradually narrowed towards the leaf-tip; lateral nerves about 12 on each side, very slender, flexuous, slightly impressed above but hardly raised beneath; veins beneath finely reticulate; petiole stout, $\frac{3}{4}$ in. long, channelled above, red-purple, transversely wrinkled when dry, glabrous. *Flowers* terminal, about 8 to a truss; pedicels about $\frac{1}{2}$ in. long, shortly but closely glandular-papillose; bracts adpressed-villous on the outer side. *Calyx* small, 5-lobed; lobes unequal, ovate-rounded, glandular-papillose. *Corolla* white within, rose-carmine outside; tube wide-turbinate, about $1\frac{1}{4}$ in. long, and about 1 in. wide at the mouth, finely puberulous near the base inside; limb over 2 in. across, 7-lobed; lobes spreading or slightly recurved, semiorbicular, emarginate, over $\frac{1}{2}$ in. long and wide. *Stamens* 12–14, included; filaments up to $\frac{3}{4}$ in. long, densely pubescent below; anthers purple, $\frac{1}{10}$ in. long. *Ovary* beset with white stalked glands, usually 6-celled, $\frac{1}{5}$ in. long; style exserted, glabrous, $1\frac{1}{4}$ in. long; stigma viscid, pale yellow, $\frac{1}{10}$ in. across.

Fig. 1, leaf-tip; 2, calyx and pistil; 3 and 4, stamens; 5, transverse section of ovary:—*all enlarged.*

M.S. del. J.N. Fitch lith.

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Tab. 8644.

CHRYSANTHEMUM FOENICULACEUM.

Tenerife.

Compositae. Tribe Anthemideae.

Chrysanthemum, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. ii. p. 424.

Chrysanthemum foeniculaceum, *Brouss. ex Willd. Enum. Hort. Berol.* p. 903; *Steud. Nom.* ed. i. p. 192; *DC. Prodr.* vol. vi. p. 66, partim; affinis *C. anethifolio*, Brouss., sed foliis glaucis profunde pinnatipartitis glabris segmentis linearibus, involucri bracteae latioribus superne membranaceis differt.

Fruticulus ad 0·75 m. altus, glaber, omnino glaucus; rami teretes vel subangulares, corymboso-adscendentes, superne herbacei, dense foliati. *Folia* petiolata, ambitu ovata, usque ad 10 cm. longa et 7 cm. expansa, pinnatipartita, segmentis linearibus lobulatis acutis 1-nervis tenuiter chartaceis vel sicco fere membranaceis, lobulis linearibus usque ad 8 mm. longis. *Capitula* numerosa, in axillis superioribus longe pedunculata, solitaria; pedunculi folia multo superantes, erecti, gracillimi, nudi. *Involucri bracteae* circiter 4-seriatae, ab extra sensim longiores, exteriores ovatae, interiores superne et secus marginem membranaceae, demum inaequaliter laceratae, glabrae. *Flores* radii numerosi, circiter 5 cm. expansi, patuli, albi; tubus brevis, parce glandulosus; lamina oblongo-lanceolata, apice denticulata; achaenia triquetra. *Flores* disci flavi; corollae tubus inferne cylindricus, superne leviter expansus, parce glanduloso-puberulus; lobi 5, ovati, obtusi. *Achaenia* oblonga, angularia, angulis membranaceo-alatis. *Pappus* brevis, oblique cupularis, inaequaliter dentatus. *Receptaculum* conicum, nudum.—*Pyrethrum foeniculaceum*, Willd. Enum. Hort. Berol. p. 903; Bot. Reg. t. 272. *Argyranthemum foeniculaceum*, Webb. Phytogr. Canar. vol. ii. p. 262, t. 93; Pitard et Proust, Iles Canar. Fl. p. 230.—J. Hutchinson.

This long-known and familiar *Chrysanthemum*, the horticultural value of which is well known and fully appreciated, is a native of the Island of Tenerife where it is endemic, and where it inhabits the barrancos or steep rocky valleys which are so marked a feature of the island at 1,000–2,000 feet above sea-level; sometimes it may be met with, more sparingly, at even lower levels. There is another *Chrysanthemum* in Tenerife, closely related to that now figured, which is restricted to the upland rocky plain, known as the Cañadas, that nearly encircles the upper portion of the mountain at about 8,000 feet elevation; according to Barker-Webb this latter is the only *Chrysanthemum* of the region above the cloud-belt in

Tenerife. Broussonet, to whom we are indebted for first distinguishing these two plants, termed the lower-level plant *C. foeniculaceum*; that from above the cloud-belt he named *C. anethifolium*. In his monogragh of the Compositae, published in 1837, De Candolle adopted a view which had already been advanced by Choisy, that these two plants are only varieties of one species. For this species De Candolle used Broussonet's name *C. foeniculaceum*, treating the barrancos plant as the type, that from the Cañadas as one of its varieties. The two plants are, however, now known to differ as markedly in their morphological characters as they do in their habitats, and when this was first realised the name *C. anethifolium*, which belongs to the high-level plant, but which had for many years gone out of use, reappeared in garden lists, though, by some mischance, in Continental collections in which both species are grown the name thus revived was misapplied to the plant from low elevations, and that of the low-level plant was transferred to the plant from higher altitudes. In this country, where only the plant from the barrancos is cultivated, there has been no opportunity of comparing the two species in the living state and of discovering the existence of the curious error which has led to *C. foeniculaceum* from the lower slopes of Tenerife being known in English gardens for at least a quarter of a century by the name of another species only found on the high plateau of that island. Our plant, easy of propagation by cuttings at all seasons, is in high and well-merited favour both in the conservatory and, in summer, also out of doors. In Tenerife *C. foeniculaceum* is in flower from January to April.

DESCRIPTION.—*Shrublet*, 2–5 ft. high, glabrous, everywhere glaucous; branches terete or slightly angular, corymbosely ascending, herbaceous upwards, densely leafy. *Leaves* petioled, ovate in outline, up to 4 in. long, $2\frac{1}{2}$ in. wide, pinnatipartite, segments linear, lobulate, acute, 1-nerved, thinly papery or almost membranous; lobules linear, up to $\frac{1}{3}$ in. in length. *Flower-heads* numerous, about 2 in. across, long-peduncled, solitary in the axils of the upper leaves; peduncles much longer than the leaves, erect, naked, very slender. *Bracts* of the involucre

glabrous, about 4-seriate, gradually longer from without inwards, the outermost ovate, the inner membranous and ultimately irregularly lacerate near the tip and along the margin. *Ray-florets* numerous, spreading, white; tube short, sparingly glandular; limb oblong-lanceolate, with denticulate apex. *Ray-achenes* triquetrous. *Disk-florets* yellow; corolla-tube cylindric below, slightly widened upwards, sparingly glandular-puberulous; lobes 5, ovate, obtuse. *Disk-achenes* oblong, with membranously winged angles. *Pappus* short, obliquely cup-shaped, unequally toothed. *Receptacle* conical, naked.

Fig. 1, ray-floret and disk-floret; 2, pappus; 3, disk-floret; 4, anthers; 5, immature disk-achene; 6, style-arms:—*all enlarged.*

M.S. del J.N. Fitch lith.

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Tab. 8645.

FUNKIA lancifolia, var. tardiflora.

Japan?

Liliaceae. Tribe Hemerocalleae.

Funkia, *Spreng.*; *Benth. et Hook. f. Gen. Plant.* vol. iii. p. 774.

Funkia lancifolia, *Spreng.*, var. **tardiflora**, *Hort. ex Kew Handlist of Herbaceous Plants*, ed. 2, p. 489 (1902); a typo foliis rigidioribus, petiolis brevioribus racemisque dense multifloris differt.

Herba. *Folia* radicalia, late lanceolata, acuta, glabra, obscure viridia, subrigida, 12 cm. longa, 3 cm. lata; nervi laterales utrinsecus circiter 4, angulo acuto adscendentes; petiolus 10 cm. longus, purpureo-maculatus, vagina 1·5 cm. lata, ovato-lanceolata, alba, purpureo-maculata. *Racemus* simplex vel ramosus, usque ad 50-florus, floribus congestis; pedunculus 30–45 cm. altus, purpureus, maculis obscurioribus notatus; bracteolae lanceolatae, acutae, pallide lilacinae, infimae usque ad 2·5 cm. longae; pedicelli graciles, 1·5 cm. longi, apice articulati. *Perianthium* pallide lilacinum; tubus infundibuliformis, 2 cm. longus; lobi oblongo-ovati, 1·2 cm. longi, 5 mm. lati, apice incrassati et minute pubescentes. *Filamenta* declinata, inaequalia, quam perianthium paullo longiora; antherae dorsifixae, oblongae, 4 mm. longae, connectivo apice obtuse producto. *Ovarium* oblongum, trisulcatum, 5 mm. longum, 1·5 mm. diametro; stylus subrobustus, staminibus longior; stigma subcapitatum, obscure trilobatum.—*F. tardiflora*, W. Irving in Garden, 1903, vol. lxiv. p. 297, cum ic.—C. H. Wright.

The *Funkia* which forms the subject of our plate has the merit of being very hardy and easily grown and propagated. It thrives in any soil of good or moderate quality, and a large stock of plants can quickly be secured by dividing up the clumps and replanting in spring. The especial value which attaches to it lies, however, in its time of flowering, which does not set in till the end of September or early October and goes on, if the weather be at all favourable, well into November, thus providing colour in the garden at a dull season of the year. The origin of this plant is obscure. It cannot be distinguished by any good morphological character from *F. lancifolia*, a species common in Japan, which extends thence to Corea and to the Kiang-si province of China, originally described by Sprengel in the Transactions of the Linnean Society, vol. ii. p. 335, in 1797, though it has leaves which are rather firmer and of a darker green,

with shorter petioles and racemes with more numerous and more closely arranged flowers. The most striking difference, however, is that typical *F. lancifolia* flowers in July. The first plant of var. *tardiflora* to reach Kew was received in 1895 from the late Mr. M. Leichtlin, of Baden-Baden. Whether it be one of the forms of *F. lancifolia* for whose selection horticulture has to thank Japanese gardeners is not clear; though several garden forms are depicted in the Phonzo Zoufou, vol. xxiii. tt. 16, 17, none of these are so densely floriferous as our plant. The material for our figure was a plant in full flower out of doors at Kew on 16th October, 1913.

DESCRIPTION.—*Herb.* *Leaves* radical, broadly lanceolate, acute, glabrous, dull green, rather firm, 5 in. long, $1\frac{1}{4}$ in. wide; lateral nerves about four on each side the midrib, ascending at an acute angle; petiole 4 in. long, blotched with purple; sheath over $\frac{1}{2}$ in. wide, ovate-lanceolate, white, blotched with purple. *Raceme* simple or branched, sometimes 50-flowered; flowers densely clustered; peduncle 1–$1\frac{1}{2}$ ft. in height, purple, with dull blotches; bracteoles lanceolate, acute, pale lilac, the lowest up to 1 in. long; pedicels slender, over $\frac{1}{2}$ in. long, articulate near the apex. *Perianth* pale lilac; tube funnel-shaped, $\frac{3}{4}$ in. long; lobes oblong-ovate, $\frac{1}{2}$ in. long, $\frac{1}{5}$ in. wide, thickened at the tip and minutely pubescent. *Filaments* declinate, unequal, rather longer than the perianth; anthers dorsifixed, oblong, $\frac{1}{6}$ in. long; connective produced, blunt. *Ovary* oblong, trisulcate, $\frac{1}{5}$ in. long; style rather stout, longer than the stamens; stigma subcapitate, faintly 3-lobed.

Fig. 1 and 2, anthers; 3, pistil:—*all enlarged.*

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BOTANICAL MAGAZINE.

CONTENTS OF No. 134, FEBRUARY, 1916.

TAB. 8646.—EUCHARIS LOWII.

„ 8647.—SOPHORA MACROCARPA.

„ 8648.—LOBELIA HOLSTII.

„ 8649.—RHODODENDRON HYPOGLAUCUM.

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Tab. 8646.

EUCHARIS Lowii.

Western Tropical America.

Amaryllidaceae. Tribe Amarylleae.

Eucharis, *Planch.*; *Benth. et Hook. f. Gen. Plant.* vol. iii. p. 731.

Eucharis Lowii, *Baker in Gard. Chron.* 1893, vol. xiii. p. 538, fig. 78; species *E. grandiflorae*, Planch. & Linden, affinis, tubo staminorum perianthio adnato, lobis tantum liberis distinguitur.

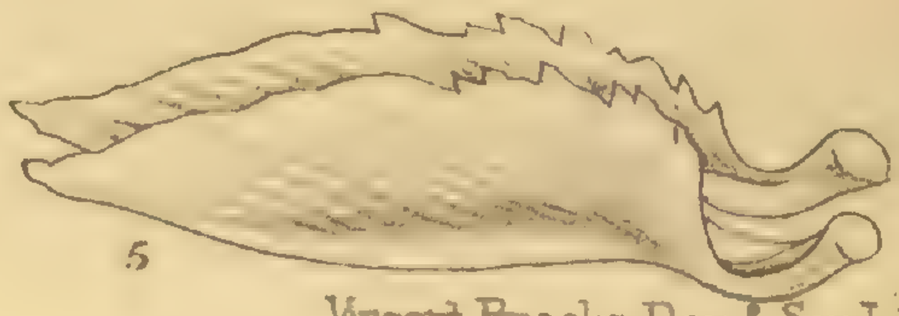
Herba perennis. *Bulbus* globosus, collo ei *E. grandiflorae* simile nisi crassiore instructus. *Folia* ovato-cordata, breviter cuspidata, glaberrima, 22 cm. longa, 18 cm. lata, nervis lateralibus approximatis venulis transversariis filiformibus connexis; petiolus 30 cm. longus. *Pedunculus* 60 cm. longus, 2–5-florus; bracteae membranaceae, late lanceolatae, 4·5 cm. longae, 8 mm. latae; pedicelli crassi, 1 cm. longi. *Perianthium* album; tubus infundibuliformis, circiter 9 cm. longus, pars inferior cylindrica 3 mm. diametro, faux 4·5 cm. diametro; lobi elliptici, subacuti, leviter concavi, 5 cm. longi, 3 cm. lati. *Staminorum* tubus perianthio adnatus; lobi emarginati, extra linea verticali luteo-viridi notati; filamentorum pars libera 2 cm. longa. *Ovarium* oblongum, viride, 3 cm. longum, 8 mm. diametro; stylus staminibus multo longior; stigma trilobum.—C. H. Wright.

Twenty-five years ago when describing and figuring *Eucharis Bakeriana*, N. E. Brown, at t. 7144 of this work, the late Sir Joseph Hooker supplied a concise *resumé* of the seven species of *Eucharis* then known, all of which are natives of the Andes of Colombia. In addition to those mentioned there, another species, *E. galanthoides*, Planch. & Linden, had been described from Brazil, while more recently yet another, *E. narcissiflora*, Huber, has been reported from the same region. Yet another, making the tenth known species and the fifth to find a place in this work, has been described since 1890. This species, *E. Lowii*, was originally imported from Colombia, among a consignment of *E. Sanderi*, Baker, by Messrs. Hugh Low and Company; it has, however, a rather wider range of distribution than its earlier known congeners from that State, for the plant from which our illustration has been prepared is one which flowered in November, 1913, in the establishment of Messrs. Sander and Sons, St. Albans, who report that they received it from Peru. In general facies *E. Lowii* much resembles *E. grandiflora*,

Planch. & Linden, figured as *E. amazonica* at t. 4971 of this work, but differs in having a thicker neck to the bulb and in the united basal part of the filaments being entirely adnate to the perianth-tube, leaving only the emarginate lobes free. The free portion of the filament springs from the sinus of the lobes and is marked on the outer side by a vertical yellowish-green line. The leaf in its general outline resembles that of *E. Sanderi*, Baker, figured at t. 6676 of this work, along with which it was, on its first appearance in cultivation, accidentally introduced. In *E. Sanderi*, however, there are fewer lateral nerves and these are connected by much stronger transverse veinlets. The fact that its affinities are so distinctly with *E. grandiflora* and *E. Sanderi* has led Mr. Baker, in a note accompanying his original description of *E. Lowii*, to suggest that it may be a hybrid between these two species. It thrives well under the cultural treatment they require. It may be noted here that another plant has been figured under Mr. Baker's name in the Journal of Horticulture for 1894 at fig. 17, and that this figure has been reproduced in the Bulletin of the Società Toscana d'Orticultura for the same year at t. 4. The plant so figured has, however, leaves which are not cordate but taper to the base, so that it is not the true *E. Lowii*.

DESCRIPTION.—*Herb*, perennial, bulb globose, neck rather stout. *Leaves* ovate-cordate, shortly cuspidate, quite glabrous, 9 in. long, 7 in. wide, lateral nerves closely set, transverse connecting veinlets very fine; petiole 12 in. long. *Peduncle* 2 ft. high, 2–5-flowered; bracts membranous, wide-lanceolate, $1\frac{3}{4}$ in. long, $\frac{1}{3}$ in. wide; pedicels stout, over $\frac{1}{3}$ in. long. *Perianth* white; tube funnel-shaped, about $2\frac{1}{2}$ in. long, the lower cylindric portion $\frac{1}{8}$ in. wide, the throat $1\frac{3}{4}$ in. across; lobes elliptic, subacute, slightly concave, 2 in. long, $1\frac{1}{4}$ in. wide. *Staminal tube* adnate to the perianth, its lobes emarginate, marked outside by a vertical greenish-yellow line; free portion of filaments $\frac{3}{4}$ in. long. *Ovary* oblong, green, $\frac{3}{4}$ in. wide; style much longer than the stamens.

Figs. 1 and 2, anthers; 3, stigma:—*all enlarged*.



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Tab. 8647.

SOPHORA macrocarpa.

Chile.

Leguminosae. Tribe Sophoreae.

Sophora, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. i. p. 555.

Sophora macrocarpa, *Smith in Rees Cycl.* vol. xxxiii. no. 6; *Lodd. Bot. Cab.* t. 1125; *DC. Prodr.* vol. ii. p. 96; *Castillo et Dey, Icog. Veg. Rio Valdiv.* vol. i. p. 67, fig. 36; ab affini *S. tetraptera*, Ait., foliolis majoribus, leguminibus haud alatis facile distinguenda.

Arbor parva; ramuli crassi, breviter adpresse albo-pubescentes. *Folia* pinnata, circiter 15 cm. longa, petiolo 2 cm. longo basi conspicue incrassato cum rhachi subtus pauperius breviter adpresse pubescente supra glabrescente nisi in canaliculo lato haud alto ubi subsericeo suffulta; stipulae angustae, 4 mm. longae; foliola utrinsecus 9, opposita vel subopposita, oblongo-lanceolata vel fere oblonga, apice rotundata, emarginulata, basi rotundata vel cuneato-rotundata, usque ad 3·5 cm. longa et 1·4 cm. lata, pagina superiore nitida, laete viridia, glabra, inferiore subglauca, pilis paucis adpressis instructa, nervis lateralibus utrinsecus circiter 8 supra parum immersis subtus conspicuis intra marginem anastomosantibus, reticulatione laxa subtus conspicua, petiolulo 1·5–2 mm. longo suffulta. *Racemi* axillares, 6–9 cm. longi, pedunculo communi quam petiolo breviore incluso, rhachi pedicellisque plus minusve breviter adpresse pubescentibus; flores penduli, cuiusque racemi circiter 10, pedicellis 2·5 cm. longis suffulti; bracteae post flores expansos deciduae, obovatae, breviter acuminatae, 8 mm. longae, 5·5 mm. latae, dorso dense adpresse brunneo-pubescentes, intra medio glabrae sed et apicem et basin versus adpresse brunneo-pubescentes. *Calyx* circiter 1 cm. longus, vix 1·2 cm. latus, extra pilis et brunneis brevibus adpressis et albis longioribus ornatus, dente inferiore 2 mm. longo, superioribus brevissimis. *Vexillum* 3 cm. longum, 2·2 cm. latum, in unguem brevem latum angustatum; alae 3 cm. longae, 0·6 cm. latae, ungui brevi suffultae; carinae petala apice libera, vix 3 cm. longa, 0·6 cm. lata. *Filamenta* usque ad 3·2 cm. longa, apice angustata, glabra. *Ovarium* 1·5 cm. altum, cum stipite 6 mm. longo breviter adpresse pubescens, stylo 1·7 cm. longo superne glabro.—*Edwardsia chilensis*, Miers, Trav. vol. ii. p. 531, nomen tantum; Lindl. Bot. Reg. vol. xxi. t. 1798.—W. G. Craib.

Two distinct species of *Sophora* from Chile, which are in cultivation in Europe, exhibit a striking resemblance as regards their flowers. One of the two, *S. tetraptera*, Ait., which also occurs in New Zealand, was figured at t. 167 of this work over one hundred and twenty years ago. The other, *S. macrocarpa*, Sm., the subject of our illustration, was first introduced by Mr. Loddiges in 1822 and was figured by him in the Botanical Cabinet at

t. 1125. Some time afterwards Professor Lindley also figured it at t. 1798 of the Botanical Register, using for the plant the name *Edwardsia chilensis* proposed by Mr. Miers. As, however, the latter did not provide a description of his species his specific name cannot now be employed. A singular confusion between this plant and the older *S. tetraptera* subsequently arose in collections, though why this should have occurred is difficult to explain, for the leaflets in *S. macrocarpa* are considerably larger than those of *S. tetraptera* and in fruit the two species differ markedly; *S. tetraptera*, as its name indicates, has a strongly four-winged pod, whereas that of *S. macrocarpa* is without any trace of wings. The material for our figure of *S. macrocarpa* came from a tree in the garden of Lady Ilchester at Abbotsbury near Weymouth, where it blossoms in May. Unfortunately the species is really hardy only in the mildest parts of the kingdom, such as the southern and western maritime districts. At Kew, in a sheltered spot, it may survive a few mild winters, but it never thrives sufficiently well to be worth cultivating out-of-doors, and has to be treated as a plant for the winter garden or unheated conservatory. It likes a sandy loam and should, if possible, be propagated by seeds, though cuttings of moderately ripened twigs will take root if placed in a mildly heated frame.

DESCRIPTION.—*Tree* of small stature; twigs stout, shortly adpressed white-pubescent. *Leaves* pinnate, about 6 in. long; petiole $\frac{3}{4}$ in. long, thickened at the base, shortly adpressed-pubescent on the lower side as is the rachis, somewhat silky in the shallow but wide channel on the upper side, otherwise glabrous; stipules narrow, $\frac{1}{6}$ in. long; leaflets 9-jugate, opposite or nearly so, oblong-lanceolate or nearly oblong, rounded and faintly emarginate at the tip, rounded or somewhat cuneate at the base, up to $1\frac{3}{4}$ in. long, over $\frac{1}{2}$ in. wide, bright green, glabrous and shining above, rather glaucous and with a few adpressed hairs beneath; lateral nerves about 8 on each side, slightly sunk above, distinctly raised beneath, looping within the margin; reticulation lax and visible beneath; petiolules short. *Racemes* axillary, about 10-flowered, including the peduncle which

is rather shorter than the leaf-stalk $2\frac{1}{2}$–$3\frac{1}{2}$ in. long; rachis and pedicels shortly adpressed-pubescent; flowers pendulous, pedicels 1 in. long; bracts deciduous, obovate, shortly acuminate, $\frac{1}{3}$ in. long, under $\frac{1}{4}$ in. wide, densely adpressed brown-pubescent behind, glabrous in the middle but adpressed brown-pubescent near the base and the tip on the upper side. *Calyx* over $\frac{1}{3}$ in. long, barely $\frac{1}{2}$ in. wide, with mixed short adpressed brown hairs and longer white hairs outside. *Standard* $1\frac{1}{4}$ in. long, nearly 1 in. wide, narrowed to a short broad claw; wings $1\frac{1}{4}$ in. long, $\frac{1}{4}$ in. wide, short-clawed; keel-petals free at the tip, barely $1\frac{1}{4}$ in. long, $\frac{1}{4}$ in. wide. *Filaments* $1\frac{1}{4}$ in. long, narrowed upwards, glabrous. *Ovary* $\frac{2}{3}$ in. long with a stipe $\frac{1}{4}$ in. long, shortly adpressed-pubescent throughout; style nearly $\frac{3}{4}$ in. long, glabrous upwards.

Fig. 1, flower with the petals removed; 2, longitudinal section of the same; 3, base of standard; 4, wing-petal; 5, keel:—*all enlarged.*

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Tab. 8648.

LOBELIA Holstii.

Tropical East Africa.

Campanulaceae. Tribe Lobelieae.

Lobelia, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. ii. p. 551.

Lobelia Holstii, *Engl. in Engl. Bot. Jahrb.* vol. xix. Beibl. 47, p. 51; species *L. coronopifoliae*, Linn., affinis sed foliis fere glabris et floribus minoribus facile distinguenda.

Herba perennis, caulibus adscendentibus vel suberectis 2–3 dm. altis teretibus glabris vel pilis adpressis instructis. *Folia* inferne sat numerosa, approximata, lanceolata, oblonga vel ovato-lanceolata, apice subacuta et leviter apiculata, basi in petiolum brevem cuneatim angustata, usque ad 4 cm. longa et 1·2 cm. lata, margine breviter et obtusiuscule serrata, serraturis apice cartilagineis, costa et nervis lateralibus pagina superiore obscuris inferiore prominulis, glabra vel ad costam (praecipue subtus) plus minusve pubescentia. *Inflorescentia* a foliis longe remota, laxe racemosa; bracteae lineares, acutae, 4 mm. longae, 0·5 mm. latae; pedicelli circiter 1 cm. longi. *Receptaculum* late turbinatum, 2 mm. diametro, pilis albis valde adpressis obtectum. *Sepala* 5, lineari-lanceolata, acuminata, acumine albo 1·25 mm. longo incluso 3·5 mm. longa, ciliolata. *Corolla* lilacina, valde bilabiata, tubo cylindrico 9 mm. longo 2·5 mm. diametro postice fisso, labio superiore 3-lobo, lobis obovato-spatulatis apice leviter apiculatis 8 mm. longis 4 mm. latis, inferiore 2-lobo recurvato lobis lanceolatis acutis 3·5 mm. longis 0·75 mm. latis. *Stamina* 5, filamentis 6 mm. longis rubro-lilacinis glabris, antheris 2 mm. longis vertice penicillatis. *Stylus* glaber.—W. B. Turrill.

The interesting *Lobelia* here figured, though evidently not at all uncommon throughout British East Africa, Uganda, and the northern districts of German East Africa, appears to be restricted to the more mountainous tracts of this region. The strong perennial roots and the aggregation of the leaves at the base of the ascending or suberect stem impart to it the facies of an alpine or subalpine species. The plant of *L. Holstii* from which our plate has been prepared is one which was raised at Kew from seed sent by Mr. E. Battiscombe from British East Africa early in 1914 and flowered in a frame in September of the same year. Here unfortunately it has failed to ripen its seeds and, having behaved as an annual, has not so far been permanently introduced to cultivation. This species is a member of the section

Holopogon, as defined in the Genera Plantarum, the apices of all its anthers being equally, though in this instance not very conspicuously penicillate. Its nearest affinity is with the well-known *L. coronopifolia*, Linn., a species widely distributed in South Africa, a figure of which was given at t. 644 of this work. In this, as in the majority of the members of the genus *Lobelia*, the flowers are bent over on their pedicels, so that the morphologically lower abaxial bilobed lip is brought above, while the morphologically upper adaxial trilobed lip is placed below. The pedicels stand almost erect in the axils of the small bracts, the top of each being bent backwards at a right angle. This causes not only the inversion of the flower but its projection from the side of the inflorescence opposite to that from which its pedicel arises.

Description.—*Herb*, perennial; stems ascending or nearly erect, 8–12 in. high, terete, glabrous or adpressed-hirsute. *Leaves* numerous, aggregated below, lanceolate, oblong, or ovate-lanceolate, subacute and slightly apiculate, cuneately narrowed below into a short petiole, the largest $1\frac{1}{2}$ in. long and $\frac{1}{2}$ in. wide, shortly and bluntly serrate, the teeth with cartilaginous tips, midrib and lateral nerves hardly visible above, slightly raised beneath, glabrous on both sides or somewhat pubescent on the midrib, particularly beneath. *Inflorescence* a considerable distance above the foliage, laxly racemose; bracts linear, acute, $\frac{1}{6}$ in. long; pedicels over $\frac{1}{3}$ in. long. *Receptacle* broadly turbinate, $\frac{1}{12}$ in. wide, hirsute with closely adpressed white hairs. *Sepals* 5, linear-lanceolate, acuminate, $\frac{1}{7}$ in. long including the white tip, ciliolate. *Corolla* lilac, markedly 2-labiate; tube cylindric, about $\frac{1}{3}$ in. long, $\frac{1}{16}$ in. wide, split on one side; larger lip 3-lobed, the lobes obovate-spathulate, slightly apiculate, $\frac{1}{3}$ in. long, $\frac{1}{6}$ in. wide, the smaller lip 2-lobed, lobes lanceolate acute, $\frac{1}{7}$ in. long, very narrow. *Stamens* 5, filaments $\frac{1}{4}$ in. long, reddish-lilac, glabrous; anthers $\frac{1}{12}$ in. long, their apices penicillate. *Style* glabrous.

Fig. 1, a flower; 2, calyx and pistil; 3, anthers:—*all enlarged*.

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TAB. 8649.

RHODODENDRON HYPOGLAUCUM.

Western China.

ERICACEAE. Tribe RHODOREAE.

RHODODENDRON, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. ii. p. 599.

Rhododendron hypoglaucum, *Hemsl. in Journ. Linn. Soc.* vol. xxvi. p. 25 (1889); *Diels in Engl. Bot. Jahrb.* vol. xxix. p. 512 (1900); *Bean in Flora & Sylva*, vol. iii. p. 164 (1905); *Hemsl. & E. H. Wils. in Kew Bull.* 1910, p. 111; *Pampanini in Nuov. Giorn. Bot. Ital.* ser. nuov. vol. xvii. p. 683 (1910); *Rehder & Wilson in Sargent, Plant. Wilson.* pars i. p. 527 (1913); affinis *R. argyrophyllo*, Franch., sed foliis plerumque latioribus filamentis minus et breviter pubescentibus differt.

Frutex magnus vel arbor usque ad 6 m. alta; ramuli juniores intense virides, primum minute nigro-puberuli, demum glabri. *Folia* sempervirentia, oblongo-oblanceolata vel oblongo-elliptica, apice subtriangulari-acuminata, conspicue cartilagineo-mucronata, ad basin subacutum sensim angustata, 7–11 cm. longa, 2–4 cm. lata, rigide coriacea, supra viridia, infra indumento plano farinoso conspicue albo-glauca; costa media supra angusta, leviter impressa, infra prominens, basi circiter 2 mm. lata, ad apicem sensim angustata; nervi laterales plerumque inconspicui, utrinsecus circiter 11, a costa sub angulo lato abeuntes, prope marginem flexuosi et ramosi; petioli 1·5–2 cm. longi, sicco verruculosi. *Inflorescentia* terminalis, 4–7-flora; perulae oblongo-lanceolatae, membranaceae, ad 2 cm. longae; bracteae filiformes, dense pubescentes, pedicellis dimidio breviores; pedicelli 2·5–4 cm. longi, breviter pubescentes, rubescentes. *Calyx* minimus, lobatus, glanduloso-puberulus. *Corolla* 4–4·5 cm. longa, 4·5–5 cm. diametro, extra roseo-alba, intus dorso carmineo-maculata; tubus turbinato-campanulatus, 2 cm. longus, extra glaber, intus glaber vel parce pubescens; lobi late ovati, apice rotundati, circiter 1·5 cm. longi et 2 cm. lati. *Stamina* 10, leviter exserta; filamenta inferne brevissime pubescentia; antherae pallide rubrae, 3 mm. longae. *Ovarium* sulcatum, fere glabrum; stylus exsertus, glaber, in stigmate truncato sensim expansus. *Fructus* curvatus, durus, 1·5–2·5 cm. longus, 5 mm. diametro, arcte verruculosus. —*R. gracilipes*, Franch. in Journ. de Bot. vol. ix. p. 391 (1895). *R. chionophyllum*, Diels in Engl. Bot. Jahrb. vol. xxix. p. 512 (1900).—J. HUTCHINSON.

The fine *Rhododendron* here described is a member of the section *Eurhododendron* which is exceedingly plentiful in Western Hupeh, where it was first collected by Mr. A. Henry in 1886 in the neighbourhood of Ichang. During his Chinese journeys it was on several occasions collected by Mr. E. H. Wilson, and in one of his field-notes it is recorded that this form may attain a height of twenty feet. Though *R. hypoglaucum* has been

independently recognised by Hemsley, Franchet and Diels as a distinct species, there is no doubt that it is exceedingly closely allied to *R. argyrophyllum*, Franch., whose home is in Western Szechuan, and Messrs. Rehder and Wilson have indicated the possibility that these two may be no more than geographical forms of one species. They are not, however, as a rule difficult to distinguish, for the leaves of *R. argyrophyllum* are usually more attenuated, and the filaments of the stamens are more densely hairy than is the case in *R. hypoglaucum*. The densely adpressed mealy indumentum which can be readily removed by scraping, to which the whiteness of the undersurface of the leaves is due, both species share with a few other allied members of the eglandular-leaved group within this section. At Kew, where *R. hypoglaucum* has been in cultivation for a number of years, the conditions do not appear altogether suitable, and it has not yet flowered. In the milder south-western counties it is more at home, and Mr. J. C. Williams, to whom we are indebted for the material for our plate, from a plant which flowered for the first time in May, 1915, in his collection at Caerhays Castle, remarks that while even under these more favourable conditions it can never find a place in the front rank of Rhododendrons, it must always be of interest as having a very distinct character of its own, and may be expected, when it reaches the age to flower freely, to acquire a certain standing among its congeners. The Caerhays example is one raised from seed obtained by Mr. Wilson during his journey of 1900–1, which was first planted by Mr. Williams late in 1906 or early in 1907. It was for several years given a situation very open to the sun, which it did not like; for the past three or four years it has been grown in partial shade, where it has thriven much better, and now forms a healthy bush of pleasing appearance, about four feet high, and over five feet through. Mr. Williams has so far been unable, however, to find a seed pod on the plant.

DESCRIPTION.—*Shrub* or small *tree*, sometimes 20 ft. high; young twigs bright green, at first puberulous with fine black hairs, at length glabrous. *Leaves* evergreen,

oblong-lanceolate or oblong-elliptic, somewhat triangular-acuminate, firmly mucronate, base subacute, 3–4½ in. long, ¾–1½ in. wide, firmly coriaceous, green above, glaucous-white owing to their close farinose tomentum beneath, midrib narrow and slightly impressed above, beneath prominent and gradually narrowed upwards from a rather broad base; lateral nerves about 11 on each side, very indistinct, emitted at a wide angle, flexuous and interarching near the margin, petiole ⅔–¾ in. long, wrinkled when dry. *Inflorescence* terminal, 4–7-flowered; scales oblong-lanceolate, membranous, up to ¾ in. long; bracts filiform, densely pubescent, half as long as the pedicels which are 1–1½ in. long, shortly pubescent and reddish. *Calyx* very small, lobed, glandular-puberulous. *Corolla* 1½–1¾ in. long, 1¾–2 in. wide, white flushed with rose outside, pink-dotted behind inside; tube turbinate-campanulate, ¾ in. long, glabrous outside, glabrous or sparingly pubescent within; lobes wide-ovate, rounded, about ⅔ in. long and ¾ in. wide. *Stamens* 10, slightly exserted; filaments very finely pubescent near the base; anthers pale red, ⅛ in. long. *Ovary* grooved, almost glabrous; style exserted, quite glabrous; stigma truncate. *Capsule* curved, hard, ⅔–1 in. long, ⅕ in. wide, closely verruculose.

Fig. 1, upper part of leaf; 2, pistil; 3 and 4, stamens; 5, transverse section of ovary:—*all enlarged*.

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BOTANICAL MAGAZINE.

CONTENTS OF No. 135, MARCH, 1916.

TAB. 8650.—ARISTOLOCHIA LAWRENCEAE.

„ 8651.—ALPINIA ELWESII.

„ 8652.—CHAMAEDOREA NANA.

„ 8653.—ANDROSACE COCCINEA.

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Tab. 8650.

ARISTOLOCHIA Lawrenceae.

Argentine.

ARISTOLOCHIACEAE.

ARISTOLOCHIA, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. iii. p. 123.

Aristolochia Lawrenceae, *N. E. Br.*; species nova ab omnibus sectionis *Unilabiatarum* floribus magnis limbo oblique oblongo vel elongato-ovato-oblongo distinctissima.

Suffrutex volubilis; caulis glaber. *Folia* petiolata, stipulata, glabra; lamina 8–11 cm. longa, 9–12 cm. lata, late et profunde cordata, apice subacuta vel obtuse rotundata, lobis basalibus late rotundatis, supra viridis, subtus glauco-virens; petiolus 5–6 cm. longus; stipulae 1–2 cm. longae, 1·5–2 cm. latae, sessiles, orbiculatae, basi cordatae, glabrae. *Flores* solitarii; pedunculi axillares, ovariis inclusis 12–14 cm. longi, ebracteati, glabri. *Perianthium* magnum, unilabiatum, luteo-album, pulchre brunneo-purpureo-venosum, glabrum; tubus supra basin inflatam subito refractus, parte inflata 5 cm. longa, 3 cm. diametro, intus prope apicem pubescente, parte superiore aequilonga subinfundibuliformi; limbus sessilis, 10–12 cm. longus, basi 7–8 cm. latus, erectus, oblique oblongus vel elongato-ovato-oblongus, apice obtusissime rotundatus. *Columna* subsessilis, leviter obconica, apice 6-loba; lobi 3 mm. longi, lanceolati, erecti, apice incurvi, obtusi. *Antherae* 6, lineares, apice basin loborum columnae attingentes. *Capsula* 10–11 cm. longa, 3·5–4 cm. diametro, oblonga, costato-hexagona, basi dehiscens. *Semina* 1·5 cm. longa, 1·3 cm. lata, plana, cuneato-obovata, subpapyracea, supra levia, subtus area centrali minute verruculosa. —N. E. Brown.

The striking *Aristolochia* which is the subject of our illustration was introduced to cultivation by the late Sir Trevor Lawrence by means of seed obtained from the Argentine, and was raised in his collection at Burford, Dorking, in 1912. The seed was sown in October of that year, and the material for our plate was supplied by Lady Lawrence, to whom the species is dedicated, from one of the original plants which flowered at Burford for the first time in June, 1914. Along with the flowering specimen was communicated part of the seed-pod with seed of the species, representations of which also appear in our figure. The character of the flower shows that *A. Lawrenceae* is a member of the group *Unilabiatae*, but within that group it stands apart; no other species has a limb bearing any close resemblance to the very oblique, oblong, untailed one of this plant. In habit this is a

strong-growing climber comparable, from the cultural standpoint, with *A. cymbifera*, Mart. & Zucc., and *A. brasiliensis*, Mart. & Zucc., two Brazilian species; like these, it may be expected to thrive well and flower freely in a moist tropical house.

DESCRIPTION.—*Shrub*; stem twining, glabrous. *Leaves* petioled, stipulate, glabrous; lamina 3–4½ in. long, 3½–5 in. broad, wide- and deep-cordate, somewhat acute, bluntly rounded at the tip, basal lobes wide-rounded, green above, glaucous-green beneath; petiole 2–2¼ in. long; stipules ⅓–¾ in. long, ⅔–¾ in. wide, sessile, orbicular, cordate at the base, glabrous. *Flowers* solitary; peduncles axillary, including the ovary 4½–5½ in. long, ebracteate, glabrous. *Perianth* large, 1-lipped, showy, yellowish-white with brown-purple veins, glabrous; tube abruptly recurved above the swollen base, the swollen portion 2 in. long, 1¼ in. wide, pubescent within near the top, upper portion about as long as the lower, somewhat funnel-shaped; limb sessile, 4–4½ in. long, nearly 3 in. wide at the base, erect, obliquely oblong or long-ovate-oblong, bluntly rounded at the tip. *Column* almost sessile, slightly obconic, 6-lobed at the tip; lobes ⅛ in. long, lanceolate, erect, incurved at the tip, obtuse. *Anthers* 6, linear, their apices reaching the bases of the lobes of the column. *Capsule* 4 in. long or rather longer, 1½–1¾ in. wide, oblong, 6-angled, the angles prominent, dehiscing from below upwards. *Seeds* about ⅔ in. long, ½ in. wide, flat, cuneate-obovate, almost papery, smooth on the upper face, finely verruculose on the central area below.

Fig. 1, inflated portion of perianth-tube, cut open to show the column and the hirsute areas within; 2, column; 3, ripe capsule; 4, seed:—*all enlarged except* 3, *which is of natural size.*

M.S.del J.N.Fitch lith.

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Tab. 8651.

ALPINIA Elwesii.

Formosa.

Scitamineae. Tribe Zingibereae.

Alpinia, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. iii. p. 648.

Alpinia Elwesii, *Turrill*; species nova *A. calcaratae*, Roscoe, affinis sed foliis subtus dense puberulis, ligula breviore dorso puberula, inflorescentia racemosa fere spicata, petalis distinctis ciliatis praecipue differt.

Herba perennis, usque ad 1·5 m. alta. *Folia* alte vaginata, vaginis extra superne puberulis longitudinaliter striatis, lineari-lanceolata, apice attenuato-acuminata, caudata, basi angustata, circiter 4·5 dm. longa et 5·5 cm. lata, pagina superiore glabra, inferiore dense puberula; ligula bifida, 4 mm. longa, dorso puberula. *Inflorescentiae* racemosae, 12 cm. longae, rhachide tomentosa, pedicellis circiter 1 mm. longis tomentosis; bracteae florales obovatae, apice rotundatae, 1·2 cm. longae, 7 mm. latae, dorso pubescentes, ciliatae. *Calyx* 1 cm. longus, saepissime breviter bilobus, unilateraliter fissus, extra dense pubescens, ciliatus, intus glaber. *Corolla* alba, tubo 1 cm. longo 4 mm. diametro glabro, lobis lateralibus elliptico-lanceolatis subacutis 1·8 cm. longis 7 mm. latis marginibus ciliatis exceptis glabris, lobo postico elliptico-obovato 1·8 cm. longo 1·3 cm. lato margine ciliato. *Labellum* ovatum, 2·2 cm. longum, 1·6–1·7 cm. latum, apice emarginatum, albo-carmineum. *Stamen* 1·7 cm. longum, filamento 7 mm. longo, 2 mm. lato. *Staminodia* lateralia 2, brevissima, basi labello adnata. *Nectarii glandula* cylindrico-ventricosa, 2·5 mm. longa, dorso longitudinaliter fissa. *Stylus* 3 cm. longus, superne leviter pubescens. *Ovarium* ovoideo-orbiculare, 3 mm. altum, 2·5 mm. diametro, dense tomentosum.—W. B. Turrill.

The handsome *Alpinia* here figured is a native of Formosa, where it was obtained by Mr. H. J. Elwes, in whose honour in has been named. The material for our illustration has been derived from a plant which flowered in his collection at Colesborne, Cheltenham, in April, 1915. This plant agrees in all respects with one presented to Kew by Mr. Elwes in 1912, with a note describing it as a very handsome form found growing in shady forest in Honsha, Formosa, at an elevation of 1,200 feet, where the temperature in winter does not fall below 50° F. The Kew plant has grown well in a border in the Mexican house, and has formed stems four feet high with leaves eighteen inches long, but has not yet flowered. A very distinctive character of *A. Elwesii* is the densely pube-

rulous nature of the entire lower surface of the leaves. The hairs are not, as in some species of the genus, restricted to the midrib or margins or both, but are equally distributed over the whole under side and impart a distinctive appearance readily recognisable by touch as well as by inspection. The inflorescence is of the racemose type, though the pedicels are so short that it appears at first sight to be spicate. It seems probable, indeed, that the pedicels are in reality lateral branches reduced to a 1-flowered condition, and that the inflorescence is a reduced panicle. The subdivision of the genus into subgenera and sections proposed by the late Professor Schumann is based on the separation or concrescence of the flowering and the leafy stems, the form and relative importance of the primary and the floral bracts, and the size of the flower. In *A. Elwesii* the flowers and leaves are borne on the same shoot, the primary bracts are unimportant and the flowers are moderately large. Its nearest ally is *A. calcarata*, Roscoe, and it therefore is best placed in the *Flos Paradisi* section of the subgenus *Catimbium*. In *A. calcarata* stages of reduction from a manifestly paniculate to a racemose or nearly spicate type of inflorescence are frequent, and it is therefore to be anticipated that, though so far none have been seen in *A. Elwesii*, instances of the converse condition, where the reduced lateral branches bear more than one flower each, may yet be met with.

DESCRIPTION.—*Herb*, perennial, up to 5 ft. high. *Leaves* markedly sheathed; sheath puberulous outside, longitudinally striate; blade linear-lanceolate, caudate-acuminate, narrowed to the base, about 18 in. long, over 2 in. wide, glabrous above, densely puberulous beneath; ligule 2-fid, $\frac{1}{6}$ in. long, puberulous outside. *Inflorescence* racemose, from 4–5 in. long; rachis tomentose; pedicels very short, tomentose; floral bracts obovate, rounded, $\frac{1}{2}$ in. long, $\frac{1}{4}$–$\frac{1}{3}$ in. wide, pubescent outside, ciliate. *Calyx* over $\frac{1}{3}$ in. long, usually shortly 2-lobed, split on one side, densely pubescent outside, ciliate, glabrous within. *Corolla* white, tube over $\frac{1}{3}$ in. long, $\frac{1}{6}$ in. wide, glabrous; lateral lobes elliptic-lanceolate, somewhat acute, $\frac{2}{3}$ in. long, over $\frac{1}{4}$ in. wide, glabrous except for the ciliate

margin, posterior lobe elliptic-obovate, $\frac{2}{3}$ in. long, $\frac{1}{2}$ in. wide, margin ciliate. *Lip* ovate, under 1 in. long, about $\frac{2}{3}$ in. wide, emarginate, white finely blotched with carmine. *Stamen* $\frac{2}{3}$ in. long, filament under $\frac{1}{3}$ in. long, $\frac{1}{12}$ in. wide; lateral staminodes 2, very short, adnate to the base of the lip. *Nectarial gland* cylindric-ventricose, $\frac{1}{10}$ in. long, split longitudinally behind. *Style* over 1 in. long, slightly pubescent upward. *Ovary* ovoid-orbicular, $\frac{1}{8}$ in. long, $\frac{1}{10}$ in. wide, densely tomentose.

Fig. 1, portion of a leaf; 2, flower showing petal, stamen, lateral staminodes and base of labellum; 3, young flower showing lateral petals, stamen from behind, lateral staminodes, portion of labellum and projecting style; 4, upper portion of style and stigma; 5, ovary, nectarial glands and base of style:—*all enlarged.*

M.S. del. J.N Fitch. lith

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Tab. 8652.

CHAMAEDOREA nana.

Costa Rica.

Palmaceae. Tribe Areceae.

Chamaedorea, *Willd.*; *Benth. et Hook. f. Gen. Plant.* vol. iii. p. 910.

Chamaedorea nana, *N. E. Br. in Kew Bulletin*, 1914, p. 156; species *C. tenellae*, Wendl., affinis sed foliis majoribus confertioribus subglaucis, spathis superioribus pedunculo vix aequalibus, spadicibus masculis ramosis, floribus viridibus et petalis liberis differt.

Frutex 30–60 cm. altus, omnino glaber. *Caulis* simplex, 1·3–1·4 cm. crassus, annulis 0·5–1 cm. distantibus notatus. *Folia* simplicia; petiolus 7·5–9 cm. longus, fere vel usque ad apicem vaginatus, apice 4–5 mm. crassus; lamina subobovato-elliptica, basi cuneata, ad medium bifida lobis acutis, leviter glaucescens, costa rigida utrinsecus circiter 11-nerve, marginibus exterioribus serrato-dentatis. *Pedunculi* axillares, solitarii, 15–20 cm. longi, 2·5–4 mm. crassi, spathis vel vaginis 5 tubulosis acutis vestiti. *Spatha* suprema pedunculum haud excedens vel eo brevior. *Spadix* masculus ramosus, ramis 4–7 recurvato-pendulis simplicibus usque ad 15 cm. longis; femineus simplex, recurvatus, viridis. *Flores* sublaxe spicati; masculi oblongi, 4 mm. longi, virides, basi lutei, calyce cupuliformi subtrilobo 1 mm. longo, petalis liberis oblongis apice incurvatis acutis, staminibus petalis duplo brevioribus ovario rudimentario subaequalibus; feminei subglobosi, 2·5 mm. diametro, virides, petalis ellipticis vel suborbiculatis obtusis concavis, ovario globoso, stylo 0·5 mm. longo, stigmate integro.—N. E. Brown.

The pleasing small Palm which forms the subject of our figure is a native of Costa Rica whence it was imported by Messrs. F. Sander and Sons, St. Albans, to whom its introduction to cultivation is due. When first distributed by them it was offered under the name *Chamaedorea pumila*. But while it belongs to this genus, our plant is very distinct from the true *C. pumila*, Wendl., in its leaves, those of *C. pumila* being twice as long and at the same time much narrower and with more acute lobes than in *C. nana* now described; the peduncle of the female spadix of *C. pumila* is also much longer than that of our plant. Its nearest ally is another small species, *C. tenella*, Wendl., a native of Mexico, from which *C. nana* differs in its larger, more clustered leaves which are paler beneath, its shorter upper spathes, its branching male spadices, and its green flowers with free petals. The material for our illustration has been

mainly derived from a plant obtained for Kew from Messrs. Sander in 1913, which flowered in a tropical house later in the same year; the inflorescence from which our figures of the female flower and pistil have been made was borne by a plant in their nursery at St. Albans. The species thrives well under stove-treatment in a loamy soil and a moist atmosphere. The Palm family is one with which the idea of a stem of considerable height is associated, and only some half-dozen species are known in which the stem is less than a yard in height. Among these short-stemmed species, *C. nana* is one of the smallest, and an adult example in full flower is not too large to be suitable for use as a table decoration.

DESCRIPTION.—*Shrub*, 1–2 ft. high, quite glabrous; stem unbranched, about $\frac{1}{2}$ in. thick, marked with distant annular leaf-scars. *Leaves* simple; lamina somewhat obovate-elliptic, 2-fid to the middle with acute lobes, cuneate at the base, somewhat glaucescent especially beneath, midrib stout, lateral nerves about 11 to each lobe, distal margin serrate-dentate; petiole 3–$3\frac{1}{2}$ in. long, sheathing almost or quite to the apex and there $\frac{1}{6}$–$\frac{1}{5}$ in. thick. *Peduncles* axillary, solitary, 6–8 in. long, $\frac{1}{10}$–$\frac{1}{6}$ in. thick, clothed with 5 tubular acute sheaths or spathes, the uppermost shorter or not longer than the peduncle. *Spadix*: male 4–7-branched, the branches recurved-pendulous, simple, up to 6 in. in length; female simple, recurved, green. *Flowers* rather loosely spicate; male oblong, $\frac{1}{6}$ in. long, green with a yellow base; female subglobose, $\frac{1}{10}$ in. across, green. *Calyx* cupular, somewhat 3-lobed, very short. *Petals*: male free, oblong, incurved and acute at the tip; female elliptic or suborbicular, obtuse, concave. *Stamens* half as long as the male petals, about as long as the rudimentary ovary. *Ovary* globose; style minute; stigma entire.

Fig. 1, a male flower; 2, the same, one petal removed; 3, a female flower; 4, ovary; 5, sketch of an entire plant:—*all enlarged except* 5, *which is much reduced.*

M S del J N Fitch lith.

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Tab. 8653.

ANDROSACE coccinea.

South-western China.

Primulaceae. Tribe Primuleae.

Androsace, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. ii. p. 632.

Androsace coccinea, *Franch. ex Pax & Knuth in Engl. Pflanzenr.–Primulac.* vol. iv. pars 237 (1905), p. 185–*sub* A. Aizoon *var.*; *Irving in Gard. Chron.* 1915, vol. lviii. p. 44; species ab *A. Aizoon*, Duby, altitudine minore inflorescentia tantum pilosa nec glandulosa foliis pilis longioribus densioribusque ciliatis scapis distincte pilosis differt.

Herba biennis, gracilis, radice crassa lignosa verticali multicipite. *Folia* numerosa, dense rosulata, spathulata, apice obtusa, brevissime mucronulata, basi valde attenuata, 2·5–3·5 cm. longa, 4–7 mm. lata, marginibus anguste translucentia vel leviter cartilaginea, valde ciliata, glauca, coriacea, glabra vel supra pilis paucis instructa, sessilia. *Scapi* 1–6, erecti vel leviter adscendentes, 5–12 cm. alti, teretes, pilosi, singuli umbellam 5–20-floram gerentes; bracteae lanceolatae, acutae, 4–9 mm. longae, pubescentes vel breviter pilosae; pedicelli plus minusve inaequales, 0·8–2·2 cm. longi, teretes, pilosi. *Calyx* turbinatus vel paullo campanulatus, fere ad medium fissus, pilosus; lobi ovato-lanceolati, obtusi vel subacuti, latiuscule scariose albo-marginati. *Corolla* hypocrateriformis tubo calycem aequante fauce plus minusve prominenter annulato; lobi obovati, obtusi, 4–5 mm. longi, 3–4 mm. lati, patentes, integri vel minutissime crenati, glabri, rubri vel intense coccinei. *Antherae* oblongae, fere sessiles. *Ovarium* obovoideum, basi annulo squamarum indurato circumdatum; stylus brevis, 1 mm. longus; stigma leviter capitatum vel truncatum. *Capsulae* valvae plerumque 5; semina oblonga, subplana.—*A. coccinea*, Franch. in Bull. Soc. Bot. Fr. vol. xxxiii. (1886) p. 63 (nomen nudum). *A. Aizoon*, Duby, var. *coccinea*, Franch. in Morot, Journ. de Bot. vol ix. (1895) p. 456. *A. Bulleyana*, Forrest in Not. Roy. Bot. Gard. Edin. vol. iv. (1908) p. 233, t. xliii A; Gard. Chron. l.c. p. 44, fig. 13. *Primula Aizoon*, var. *coccinea*, Derganc in Kneucker, Allg. Bot. Zeitschr. vol. x. (1904) p. 110.—M. B. Scott.

The interesting *Androsace* which forms the subject of our plate is a native of Yunnan where it was first discovered by the late Abbé Delavay prior to 1885, and whence it was first introduced into European horticulture, when its flowering was recorded in the Jardin des Plantes in 1891. It was met again in eastern Tibet by the Abbé Soulié in 1893, and was rediscovered by Mr. G. Forrest in north-western Yunnan in September, 1906, at an altitude of 10,000 feet, on dry rocky hillsides in the descent from the Chung-tien plateau to the Yang-tse valley near Tang Tui. The name *A. coccinea*, by which

this plant was known when first introduced to cultivation, was given to it by the late Mr. Franchet as long ago as 1886, but although the name was duly recorded in that year, no description of the plant was then published. After the receipt of Soulié's Tibetan specimens, Franchet in 1895 reconsidered his earlier view and, when describing the plant, referred it, as a variety, to *A. Aizoon*, Duby, a nearly allied but much larger species which is characteristic of similar localities in western Tibet and northern Kashmir. While, however, Franchet then used for the presumed variety his original specific name, he did not formally indicate the identity of the plant described with the species already in cultivation as *A. coccinea*. That the two are the same thing was first authenticated in the 'Pflanzenreich' in 1905. To Mr. Forrest we are indebted not only for the re-introduction of this beautiful plant, but for pointing out that it fully deserves to be considered a species apart from *S. Aizoon*, though the suggestion that it is distinct also from the plant which Franchet referred to that species as var. *coccinea* is now known to have been unnecessary. In the 'Gardeners' Chronicle' in 1915 caution was enjoined on this point, and a careful examination of adequate suites of specimens has shown that the minute differences relied upon as distinguishing Forrest's plant from the original *A. coccinea* collected by Delavay are not constant. The material for our figure has been obtained from one of Forrest's plants grown at Kew, where *A. coccinea* has proved somewhat difficult to manage during the winter which intervenes between the season in which it forms only a rosette of leaves and that in which it produces its scapes. It is barely hardy, for while plants in boxes in a frame whence frost is excluded thrive well, others in pots in an ordinary cold frame suffer many casualties. The most suitable soil has been found to be a well-drained loam.

DESCRIPTION.—*Herb*, biennial, slender with a stout woody, several-crowned, vertical root. *Leaves* numerous in a close rosette, sessile, spathulate, obtuse but finely mucronulate, much narrowed to the base, 1–1½ in. long, ⅙–¼ in. wide, with narrow translucent or slightly

cartilaginous, strongly ciliate margins, glaucous, coriaceous, glabrous or with a few hairs on the upper surface. *Scapes* 1–6, erect or slightly ascending, 2–4½ in. long, terete, pilose, each supporting a 5–20-flowered umbel; bracts lanceolate, acute, ⅙–⅓ in. long, pubescent or shortly pilose; pedicels rather unequal, ⅓–¾ in. long, terete, pilose. *Calyx* turbinate or somewhat campanulate, pilose, divided nearly to the middle into 5 ovate-lanceolate obtuse or subacute lobes with wide scarious white margins. *Corolla* salver-shaped; tube as long as the calyx; throat more or less prominently annulate; lobes obovate, obtuse, ⅙–⅕ in. long, ⅛–⅙ in. wide, spreading, entire or very finely crenate, glabrous, vermilion or cinnabar-red. *Anthers* oblong, almost sessile. *Ovary* obovoid, surrounded at the base by a hard ring of scales; style short; stigma shortly capitate or truncate.

Fig. 1, leaf; 2, hairs from the same; 3, calyx; 4, corolla, laid open; 5 and 6, stamens; 7, pistil:—*all enlarged.*

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BOTANICAL MAGAZINE.

CONTENTS OF No. 136, APRIL, 1916.

TAB. 8654.—SOPHROLAELIA PSYCHE.

„ 8655.—CLEMATIS PAVOLINIANA.

„ 8656.—EUONYMUS BUNGEANUS.

„ 8657.—LUPINUS CHAMISSONIS.

„ 8658.—ALNUS CORDATA.

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Tab. 8654.

SOPHROLAELIA Psyche.

Garden hybrid.

Orchidaceae. Tribe Epidendreae.

Sophrolaelia, *Rolfe in Orch. Rev.* 1894, p. 333.

Sophrolaelia Psyche, *Rolfe in Orch. Rev.* 1902, p. 55; *Cogn. et Gooss. Dict. Ic. Orch., Sophrolaelia*, t. 1; *Rolfe & Hurst, Orch. Stud-Book*, p. 236; hybrida inter *Laeliam cinnabarinam*, Lindl. et *Sophronitin grandifloram*, Lindl., **artefacta.**

Herba epiphytica; pseudobulbi aggregati, fusiformi-oblongi, 3–6 cm. longi, vaginis membranaceis obtecti, monophylli. *Folia* oblonga, subobtusa, suberecta vel recurva, coriacea, 7–12 cm. longa, 2–2·5 cm. lata. *Scapi* terminales, suberecti, 2–3-flori; bracteae subulato-oblongae, acutae, 4–6 mm. longae; pedicelli 3·5–4 cm. longi. *Flores* speciosi, aurantiaci. *Sepala* et *petala* subrecurva, elliptico-oblonga, subacuta, 2–2·5 cm. longa. *Labellum* trilobum, 2–2·5 cm. longum; lobi laterales oblongi, circa columnam involuti; lobus intermedius recurvus, lanceolatus, subacutus, crispo-undulatus. *Columna* clavata, circiter 1 cm. longa. *Pollinia* 8, in quoque loculo 4, cerea, compressa, paris inferioris adscendentia, cum eis paris superioris descendentibus in quoque loculo appendicula granulosa lineari connexa.—R. A. Rolfe.

The Orchid which forms the subject of our plate is a garden plant of hybrid origin which, nevertheless, is of sufficient scientific interest to justify a deviation from our general practice of excluding from the Botanical Magazine illustrations of artificially raised forms. This interest does not reside in the fact that the *Sophrolaelia* here figured is the result of a combination between species that are referred to two genera usually accepted as distinct. As a matter of fact it is but one of fourteen hybrids of garden origin which are claimed to have been made between species of *Laelia* and species of *Sophronitis*. Nor is the phenomenon restricted to these two genera; over thirty are recorded as having been produced by crossing species of *Sophronitis* with species of *Cattleya*, and some fifty are enumerated into whose composition all three genera mentioned are said to enter. It is clear that the relationship between these three genera is so close that in their case intercrossing is easy, while the considerations which guide us in the delimitation of genera remain of necessity matters of opinion and con-

venience. The interest in this case lies in the fact that without a knowledge of the history of the origin of the plant now described it could hardly fail to be taken for a species of *Laelia*, so predominant in it are the characters which mark that genus. Though perhaps the most interesting botanically of the forms of *Sophro-laelia* hitherto produced it is, partly on this account, less striking from a cultural standpoint than several of the others. The parents of *S. Psyche*, which was raised by Messrs. Charlesworth and Company at Heaton, near Bradford, and flowered for the first time in their establishment in January, 1902, were *Laelia cinnabarina*, Lindl., figured at t. 4302 of this work, which was the seed-bearer, and *Sophronitis grandiflora*, Lindl., figured in our t. 3709. A comparison of our figure with that of the seed parent shows that this hybrid in habit closely resembles a dwarfed condition of that *Laelia*, the influence of the *Sophronitis* being only apparent in the somewhat modified structure and colour of the flowers. The characters of *Laelia cinnabarina*, however, seem dominant in most of its hybrids. The plant figured was presented to the national collection at Kew in 1912 by Messrs. Charlesworth and Company, and has thriven well in a tropical house under the conditions suitable for species of *Cattleya*. It flowered at Kew in February, 1915.

DESCRIPTION.—*Herb*, epiphytic; pseudobulbs clustered, oblong-fusiform, $1\frac{1}{4}$–$2\frac{1}{2}$ in. long, 1-foliate, clothed with membranous sheaths. *Leaves* oblong, rather blunt, suberect or recurved, coriaceous, 3–5 in. long, $\frac{3}{4}$–1 in. wide. *Scapes* terminal, suberect, 2–3-flowered; bracts subulate-oblong, acute, $\frac{1}{6}$–$\frac{1}{4}$ in. long; pedicels about $1\frac{1}{2}$ in. long. *Flowers* showy, orange-yellow. *Sepals* and *petals* somewhat recurved, elliptic-oblong, subacute, $\frac{3}{4}$–1 in. long. *Lip* 3-lobed, $\frac{3}{4}$–1 in. long; lateral lobes oblong, folded round the column; mid-lobe recurved, lanceolate, subacute, crispate. *Column* clavate, about $\frac{2}{5}$ in. long. *Pollinia* 8, waxy, compressed; two pairs in each loculus, those of the upper pair ascending, of the lower pair pendulous, both pairs united by means of a granular linear process.

Fig. 1, lip; 2, column; 3, anther-case; 4, pollinia:—*all enlarged.*

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Tab. 8655.

CLEMATIS Pavoliniana.

China.

Ranunculaceae. Tribe Clematideae.

Clematis, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. i. p. 3.

Clematis Pavoliniana, *Pampanini in Nuov. Giorn. Bot. Ital.* 1910, n.s. vol. xvii. p. 270; *Rehder et E. H. Wilson. in Sarg. Pl. Wils.* vol. i. p. 328; affinis *C. Meyenianae*, Walp., a qua inflorescentia triflora vel racemosa pauciflora, sepalis quam staminibus conspicue longioribus recedit.

Frutex scandens, praeter flores glaber. *Caules* costati. *Folia* trifoliolata, satis longe petiolata; foliola petiolulata, ovata, apice acuta vel acuminata, basi cordata ad rotundata, 5–10 cm. longa, 3–5 cm. lata, integerrima, tenuiter coriacea, glabra, trinervia; petiolus in basin valde ampliatus, applanatus. *Inflorescentiae* axillares, basi eperulatae, in planta nostra triflorae; bracteae lanceolatae, acutae, 3–4 mm. longae; pedicelli 2–4 cm. longi, laterales basi vel inferne bracteolati. *Sepala* 4, patentia, lanceolata, extra viridia margine albo-pubescente, intus alba, 1·5–2 cm. longa, 4–5 mm. lata. *Stamina* numerosa; filamenta glabra, exteriora quam antherae longiora, interiora quam antherae breviora; antherae oblongo-lineares, lateraliter dehiscentes connectivo in cuspidem producto. *Pistilla* pluria, circiter 8 mm. longa; ovarium pilosum, stylus in sicco fulvo-plumosus.—T. A. Sprague.

The *Clematis* which forms the subject of our illustration occurs throughout a very extensive area in Central China, and is met with in all the provinces from Szechuan to Chekiang and Fokien. It may be regarded as the representative in this region of *C. Meyeniana*, Walp., figured at t. 7897 of this work, which, it would appear, is probably confined to southern China. From that species *C. Pavoliniana* is readily distinguished by its 3-flowered or racemosely 5–7-flowered inflorescence and by its considerably larger sepals. From *C. uncinata*, Champ., a form of which species was recently figured at t. 8633 of this work, the pilose ovary at once separates the present plant. The example from which the material for our plate of *C. Pavoliniana* has been derived was raised at Kew from seed collected by Mr. E. H. Wilson in the neighbourhood of Ichang, in western Hupeh, where the species is said to be abundant in glens and ravines. This seed was received at Kew from the Arnold Arboretum

in March, 1908, and one of the plants raised flowered for the first time in June, 1913. We are as yet unable to supply definite information as to its ability to withstand our climate. It has hitherto been grown on a south wall where it has kept quite healthy, but it is doubtful if it would thrive without shelter of this kind. In its behaviour under cultivation it closely resembles its southern ally *C. Meyeniana* and, having regard to the elevations at which it naturally occurs, it probably possesses the same power of withstanding cold. It needs a good loamy soil, and may be expected to thrive well on calcareous formations. Its chief value in gardens will be in making an addition to the rather scanty number of cultivated climbers which are evergreen.

DESCRIPTION.—*Shrub*, all parts save the flowers glabrous; stems climbing, costate. *Leaves* 3-foliolate, rather long-petioled; leaflets petiolulate, ovate, acute or acuminate, base cordate to rounded, 2–4 in. long, $1\frac{1}{4}$–2 in. wide, quite entire, thinly coriaceous, glabrous, 3-nerved; petiole considerably widened at the base, flattened. *Inflorescence* axillary, without bud-scales, in cultivated examples 3-flowered; bracts lanceolate, acute, $\frac{1}{8}$–$\frac{1}{6}$ in. long; pedicels $\frac{3}{4}$–$1\frac{1}{2}$ in. long, the lateral bracteolate near the base. *Sepals* 4, spreading, lanceolate, green externally with a white pubescent margin, white within, $\frac{2}{3}$–$\frac{3}{4}$ in. long, $\frac{1}{6}$–$\frac{1}{5}$ in. wide. *Stamens* many; filaments glabrous, the outer longer, the inner shorter than the anthers; anthers oblong-linear, laterally dehiscent; connective cuspidately produced. *Pistils* several, about $\frac{1}{3}$ in. long; ovary pilose; style, when dry, plumose with tawny hairs.

Figs. 1 and 2, stamens; 3, pistil:—*all enlarged.*

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Tab. 8656.

EUONYMUS Bungeanus.

Manchuria and N. China.

Celastraceae. Tribe Celastreae.

Euonymus, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. i. p. 360.

Euonymus Bungeanus, *Maxim. Primit. Fl. Amur.* p. 470; *Mél. Biol.* vol. xi. p. 188; *Loes. in Engl. Jahrb.* vol. xxx. p. 461; *Schneider, Laubholzk.* vol ii. p. 177; *Rehder in Sargent, Trees & Shrubs,* t. 69; foliis longe petiolatis caudato-acuminatis distinctus.

Frutex vel *arbuscula*, circiter 4 m. alta. *Ramuli* graciles. *Gemmae* hibernae oblongo-ovoideae, perulis ciliatis. *Folia* decidua, longe petiolata, elliptica, apice caudato-acuminata, basi cuneata, 5–7·5 cm. longa, 2–3 cm. lata; petioli 1·7–2·5 cm. longi. *Cymae* in axillis bractearum caducarum ex parte inferiore ramulorum ortae, semel ad ter furcatae. *Flores* tetrameri. *Sepala* suborbicularia, circiter 1·5 mm. diametro, patentia, demum deflexa. *Petala* patentia, tandem leviter deflexa marginibus plus minusve reflexis, albido-viridula, ima basi rubella, late ovata, 3·5 mm. longa, ultra 2·5 mm. lata. *Discus* 4-lobus, intense viridis. *Stamina* in disci lobis insidentia; filamenta crassa, vix 0·5 mm. longa; antherae reniformes, kermesinae, circiter 0·5 mm. longae. *Ovarium* pyramidale, tetragonum, 4-loculare, 1 mm. altum; stylus 0·75–1 mm. longus stigmatibus 4 minimis inclusis. *Ovula* pro loculo bina, adscendentia. *Capsula* 4-loba, roseo-alba. *Semina* sordide rosea; arillus coccineus, e raphi ortus, partem seminis majorem includens, apertura abraphiali.– *E. micranthus*, Bunge, Enum. Pl. Chin. Bor. p. 14, non D. Don.—T. A. Sprague.

The shrub here described is a member of a group of eastern Asiatic species nearly allied to the familiar Spindle Tree, *Euonymus europaeus*, Linn., but all of them easily distinguishable by their purple anthers. The species figured, *E. Bungeamus*, which is at once recognisable by its long-stalked leaves, appears to be confined to Manchuria and northern China. There are records of its presence further south, but the plants referred to are found on examination to belong to other species. In the species here dealt with the scarlet aril arises from the raphe and envelops the greater part of the seed, leaving an irregularly rounded aperture on the side opposite to the raphe. In a recent account of *E. Bungeanus* (Mitteil. Deutsch. Gesellsch. 1910, p. 107) Dr. Koehne has described an aril of a different type, with an apical opening. As, however, he informs us

that the petiole of his plant is often considerably less than one-fourth the length of the leaf-blade it appears probable that some other species is in question. The material for our plate has been provided by a plant purchased for Kew in 1891 from Mr. Dieck of Zoeschen, which is now about ten feet high and as much across, with a graceful habit due to the slender ultimately pendulous branches. Unfortunately *E. Bungeanus* does not bear fruit at Kew so regularly as most of its cultivated congeners; in the autumn of 1914, however, it made a very pleasing display owing to the abundance of its capsules, whose colour is unusual among the hardy members of the genus. The plants at Kew promise to assume eventually a tree-like form; they are perfectly hardy and grow vigorously in loamy soil. The foliage dies off yellow in autumn. In the absence of seeds, which are only available in certain seasons, cuttings may be used for propagation.

DESCRIPTION.—*Shrub* or small *tree*, about 15 ft. high; twigs slender; winter buds oblong-ovoid, their scales ciliate. *Leaves* deciduous, long-petioled, elliptic, caudate-acuminate, base cuneate, 2–3 in. long, $\frac{3}{4}$–$1\frac{1}{4}$ in. wide; petiole $\frac{2}{3}$–1 in. long. *Cymes* arising from the axils of deciduous bracts along the lower portion of the twigs, once to thrice forked. *Flowers* tetramerous. *Sepals* suborbicular, very small, spreading, at length deflexed. *Petals* spreading, ultimately slightly deflexed, their margins turned back, whitish-green with reddish base, wide ovate, small. *Disk* 4-lobed, bright green. *Stamens* inserted on the lobes of the disk; filaments stout, very short, anthers reniform, purple-crimson. *Ovary* pyramidal, 4-angled, 4-celled; style short; stigmas 4, minute. *Ovules* 2 to each cell, ascending. *Capsule* 4-lobed, pale rose. *Seeds* dull rose; aril bright red, rising from the raphe and enveloping the greater bulk of the seed, leaving an aperture on the side away from the raphe.

Fig. 1, a flower; 2 and 3, seed with its aril, seen from behind and from one side; 4, seed in section, showing the embryo:—*all enlarged*.

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Tab. 8657.

LUPINUS Chamissonis.

California.

Leguminosae. Tribe Genisteae.

Lupinus, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. i. p. 480.

Lupinus Chamissonis, *Eschsch. in Mém. Acad. Pétersb.* vol. x. p. 288 (1826); *Walp. Repert.* vol. i. p. 603; *Jepson, Fl. W. Mid. Calif.* p. 315, *Heller in Muhlenbergia*, vol. vi. p. 111; species *L. albifronti*, Benth. affinis sed vix fruticulosa, floribus haud uniformiter coeruleis carina eciliata distincta.

Suffrutex densus, 3–10 dm. altus, ramosus, caulibus sericeo-tomentosis vel superne sericeo-pubescentibus indumento subargenteo ramis paucis elongatis pluribus abbreviatis. *Folia* plerumque 5–7-foliolata; foliola oblanceolata, longe cuneatim attenuata, obtusa vel subobtusa breve cuspidata, 15–30 mm. longa, 4·7 mm. lata, utrinque adpresse argenteo-sericea; petiolus 15–25 mm. longus; stipulae subulatae, ad 5–8 mm. petiolo adnatae, parte libera 6–7 mm. longa. *Racemus* 5–10 cm. longus, laxus vel densiusculus floribus solitariis vel rarius magis minusve verticillatis; bracteae lanceolatae, acuminatae, sericeo-tomentosae, ad 1 cm. longae, cito caducae; pedicelli 5–6 mm. longi, albo-tomentelli. *Calycis* 6–7 mm. alti labium superum ad medium vel ultra 2-fidum, inferum lanceolatum, obtusiusculum, utrinque albo-tomentosum. *Corolla* variegata; vexillum explanatum orbiculare, caerulescens vel lilacinum basi maculo amplo flavido ornatum, 10–12 mm. altum; alae late suboblique oblongo-ellipticae, obtusissimae, apicem versus caerulescentes, ceterum albidae; carina anguste acute rostrata, eciliata, rostro atro-violaceo excepto albida. *Ovarium* argenteo-tomentosum. *Legumen* late lineare, 2·5–4 cm. longum, 7–8 mm. latum, tomentosum, inter semina oblique impressum.—O. Stapf.

The Papilionaceous genus *Lupinus* to which the subject of our illustration belongs is highly developed in North America. The late Mr. Sereno Watson in 1873 published a careful revision of the species then known to occur in extra-tropical North America which includes accounts of fifty-six different forms. During recent years valuable contributions towards a more complete knowledge of this large and very natural genus, based on an extensive acquaintance with its species in the field, have appeared in the American botanical journal 'Muhlenbergia,' and in 1910, in the sixth volume of this periodical Mr. A. A. Heller, the author of these articles, has expressed his belief that in the New World to the north of Mexico, no fewer than two hundred and thirty distinct forms

occur. Mr. Heller's promised illustrated monograph of the North American species has not, however, yet been completed, and until it appears the systematic classification of the Lupins must leave much to be desired. The species here figured is a low rather dense bushy denizen of the sand dunes of the Californian littoral from San Diego to a little beyond San Francisco, readily distinguished, among the species with silvery foliage, by the large and persistently yellow blotch of the standard. The plant which has provided the material for our plate was purchased for Kew in 1913 from Messrs. Bees, Limited, of Liverpool, under the name *L. argenteus*. It is not, however, the true *L. argenteus*, Pursh; nor is it the *L. argenteus* of Agardh which is a form of *L. ornatus*, Dougl., or the *L. argenteus* of Watson which is a form of *L. laxiflorus*, Dougl., which are also natives of western North America. Our plant, *L. Chamissonis*, was first described by Eschscholtz ninety years ago. Its nearest ally is *L. albifrons*, Benth., another Californian species which has been confused with it, but which is easily distinguished by the characters indicated by Dr. Stapf. At Kew *L. Chamissonis* thrives in well-drained light soil if planted against a south wall, beginning to flower in June and continuing to do so freely till the end of November. In the neighbourhood of Los Angeles it is said to flower nearly all the year round. At Kew it matures good seeds and is thus easily propagated.

Description.—*Undershrub* of compact habit; stem 1–3½ ft. high, somewhat silvery silky tomentose or upwards silky pubescent, with a few elongated and many short branches. *Leaves* usually 5–7-foliolate, leaflets oblanceolate, somewhat obtuse, shortly cuspidate, base cuneately narrowed, ⅔–1¼ in. long, ⅙–¼ in. wide, adpressed silvery silky on both surfaces; petiole ⅔–1 in. long; stipules subulate, adnate to the petiole for ⅕–⅓ in., their free portion about ¼ in. long. *Raceme* 2–4 in. long, loose or rather compact, the flowers solitary or casually more or less whorled; bracts lanceolate, acuminate, silky tomentose, up to ⅖ in. long, soon caducous; pedicels ⅕–¼ in. long, white tomentellous. *Calyx* about ¼ in. long, 2-lipped, white tomentose; upper lip 2-fid to or beyond

the middle, lower lanceolate, rather obtuse. *Corolla* variegated; standard flattened orbicular, blue or lilac with a large yellow basal blotch, nearly $\frac{1}{2}$ in. long; wings wide, somewhat obliquely oblong-elliptic, very obtuse, blue towards the tip, elsewhere whitish; keel narrowly acutely beaked, eciliate, the beak dark violet, otherwise whitish. *Ovary* silvery tomentose. *Pod* wide linear, 1–1$\frac{3}{4}$ in. long, nearly $\frac{1}{3}$ in. wide, tomentose, obliquely grooved between the seeds.

Fig. 1, base of petiole and stipules; 2, leaflet; 3, calyx, laid open, with stamens and pistil; 4, standard; 5, wing-petal; 6, keel-petal; 7, pistil:—*all enlarged.*

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Tab. 8658.

ALNUS cordata.

Italy and Corsica.

Cupuliferae. Tribe Betuleae.

Alnus, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. iii. p. 404.

Alnus cordata, *Desf. Tabl. Hort. Paris,* ed. 2, p. 244; *Dippel, Handb. d. Laubholzk.* Teil ii. p. 148; *Winkler in Engl. Pflanzenr.–Betulaceae,* p. 110, fig. 26; *C. K. Schneider, Handb. d. Laubholzk.* vol. i. p. 125, fig. 67, e–e²; *Henry in Elwes & Henry, Trees of Gt. Brit. & Irel.* vol. iv. p. 949, t. 254; *Briquet, Prodr. Fl. Corse,* vol. i. p. 406; species *A. subcordatae,* C. A. Meyer, maxime affinis, sed ramulis glaberrimis, foliis saepe late ovatis vel suborbicularibus regulariter crenato-serratis basi majus cordatis, amentis masculis brevioribus, strobilis majoribus differt.

Arbor pyramidalis, ad 24 m. alta cortice griseo-brunneo leviter verrucoso; ramuli juniores glaberrimi. *Folia* saepe late ovata vel suborbicularia, interdum elliptica, apice acuta acuminata vel rotundata, basi plus minusve cordata, rarius rotundata vel truncata, 6–9 cm. longa, 5–7 cm. lata, supra glaberrima, atro-viridia, nitida, infra pallidiora, praeter venarum axillas barbellatas glaberrima, interdum utrinque punctulis resinosis aspersa; venae laterales primariae utrinsecus 6–10; petiolus 2·5–5 cm. longus. *Amenta mascula* 3–6, in racemum terminalem disposita, 5–12 cm. longa. *Amenta femina* (strobili) solitaria vel 2–3 in racemo erecto; fructifera ovoidea vel ellipsoidea, 2·5–3 cm. longa, 1·5–2 cm. lata. *Nuculae* suborbiculares ala angusta cinctae.—*A. cordifolia,* Ten. Fl. Nap. Prodr. p. 54, et Fl. Nap. vol. ii. p. 340, t. 99; Lodd. Bot. Cab. t. 1231; Loud. Arb. et Frut. Brit. vol. iii. p. 1689, fig. 1545; Bertol. Fl. Ital. vol. x. p. 160; Regel, Monogr. Betulac. p. 110, t. 16, fig. 21–27, et in DC. Prodr. vol. xvi. pars 2, p. 185; Gard. Chron. 1883, vol. xix. p. 284, fig. 42; Piccioli, Piante Legn. Ital. p. 281; Mouillefert, Traité des Arbres, p. 1131, t. col. 20; Bean, Trees & Shrubs, vol. i. p. 179, cum icon. *A. neapolitana,* Savi, Tratt. Alb. Tosc. ed. 2, vol. ii. p. 21. *A. macrocarpa,* Req. ex Nyman, Consp. p. 672. *Betula cordata,* Loisel. Notice, p. 139.—S. A. Skan.

The Italian alder, popularly known in Italy as the Ontano Napoletano, is the second of the seventeen species comprising the genus to appear in the Botanical Magazine; the other, *A. nitida,* Endl., from the Western Himalaya, is figured at t. 7654. It is a handsome tree, flourishing in dry as well as in damp situations, in the former, according to Mouillefert, better than either the common or the grey alders. Its introduction into this country dates from the year 1820, and it is now represented in cultivation by many fine specimens. The finest known

to Messrs. Elwes and Henry is that growing on the lawn at Tottenham House, Savernake, Wiltshire, which is 69 feet high and has a trunk measuring 9 feet 3 inches in circumference at 4 feet from the ground. In height this is slightly exceeded by a tree growing near the pond in front of Museum No. 1 at Kew. This is 71 feet high, the trunk having a girth of 5 feet 8 inches; from this tree the material for our figure was obtained. Though exceeded in girth by several others in England the Kew tree surpasses in height any other specimen of *A. cordata* in the British Isles. The species is restricted to Southern Italy, from the neighbourhood Naples southwards, and the islands of Ischia and Corsica. On Mount Serino it forms forests. The form figured has been distinguished as var. *genuina*, Winkler (A. cordifolia, α genuina, *Regel*), characterised by the acute or acuminate leaves, while the form with suborbicular leaves, very obtuse or rounded at the apex, is known as var. *rotundifolia*, Dippel (= A. rotundifolia, *Bertol.*). The latter, according to Briquet, is the only form found in Corsica. It is also met with in Italy, but less frequently than the variety *genuina*. *A. cordata* var. *tschmela*, Sommier & Levier, from the Caucasus, is probably, as Winkler suspects, the same as *A. subcordata* var. *villosa*, Regel. *A. elliptica*, Reg., originally found on the banks of the River Salenzara in Corsica, is a natural hybrid between *A. cordata* and *A. glutinosa*. The Italian alder flowers in March before the appearance of the leaves. For growing in damp places such as the margins of ponds and streams there are few more handsome trees; the size of the leaves and their deep lustrous green colour make it perhaps the most desirable of the alders. It produces seed freely and can thus be readily propagated.

Description.—*Tree* of pyramidal shape, up to 80 ft. high; bark greyish-brown, slightly verrucose; young twigs quite glabrous. *Leaves* often wide ovate or almost orbicular, sometimes elliptic, apex acute or acuminate or rounded, base more or less cordate, rarely rounded or truncate, $2\frac{1}{2}$–$3\frac{1}{2}$ in. long, 2–$2\frac{3}{4}$ in. wide, and quite glabrous above, dark green, shining, paler beneath, and quite glabrous save for tufts of hairs in the angles of the

nerves, sometimes with resinous dots on both surfaces; main lateral veins 6–10 on each side; petiole 1–2 in. long. *Male catkins* 3–6 in a terminal raceme, each catkin 2–4½ in. long. *Female catkins* (cones) solitary or 2–3 in an erect raceme; in fruit ovoid or ellipsoid, 1–1¼ in. long, ⅔–¾ in. wide. *Nutlets* suborbicular with a marginal wing.

Figs. 1 and 2, scales with male flowers; 3, a male flower; 4 and 5, scales with female flowers; 6 and 7, fruit scales with nutlets; 8, gland-scale from nutlet:—*all enlarged.*

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BOTANICAL MAGAZINE.

CONTENTS OF No. 137, MAY, 1916.

TAB. 8659.—RHODODENDRON DECORUM.

„ 8660.—PENTSTEMON RUPICOLA.

„ 8661.—CYTISUS RATISBONENSIS.

„ 8662.—ERIA TOMENTOSA.

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Tab. 8659.

RHODODENDRON DECORUM.

Western China.

ERICACEAE. Tribe RHODOREAE.

RHODODENDRON, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. ii. p. 599.

Rhododendron decorum, *Franch. in Bull. Soc. Bot. Fr.* vol. xxxiii. p. 230 (1886), et *in Nouv. Arch. Mus. Paris*, sér. ii. vol. x. p. 45 (1888); *Hemsl. in Journ. Linn. Soc.* vol. xxvi. p. 22 (1889); *Diels in Engl. Bot. Jahrb.* vol. xxix. p. 511 (1900); *Bean in Flora & Sylva*, vol. iii. p. 163 (1905); *Hemsl. et E. H. Wils. in Kew Bull.* 1910, p. 109; *Rehder & E. H. Wils. in Sarg. Pl. Wilsonianae*, vol. i. p. 541; *Bean, Trees & Shrubs*, vol. ii. p. 357 (1914); affinis *R. Fortunei*, Lindl., sed foliis plerumque angustioribus, floribus emaculatis differt.

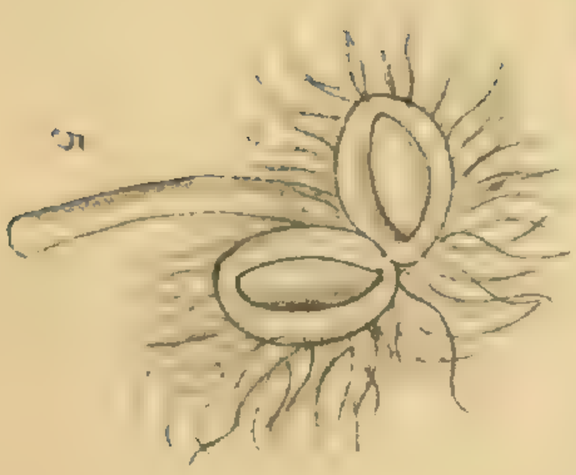
Frutex usque ad 5 m. altus; ramuli robusti, glabri. *Folia* oblonga vel oblongo-elliptica, utrinque rotundata vel basi attenuata, apice obtuse mucronata, 7–12 cm. casu usque ad 20 cm. longa, 2·5–5 cm. lata, rigide coriacea, utrinque glabra, supra arcte reticulata; costa supra leviter impressa, infra prominens, laminae apicem versus sensim attenuata; nervi laterales utrinsecus 9–12, a costa sub angulo 70° abeuntes, prominenter furcati, utrinque prominuli; petioli 1–1·5 cm. longi, robusti, supra fere plani, infra subcarinati. *Inflorescentia* circiter 10-flora, 20 cm. expansa; pedicelli robusti, 3–3·5 cm. longi, glandulis subsessilibus parce induti. *Calyx* bene evolutus, cupularis, 2·5–3 mm. altus, extra et margine undulato parce glandulosus. *Corolla* alba vel leviter albo-viridis vel rosea; tubus 3 cm. longus, glaber; limbus 8–9 cm. expansus, lobis 7 suborbicularibus emarginatis circiter 2·5 cm. latis. *Stamina* 16; filamenta inferne parce puberula, usque ad 3 cm. longa; antherae vix exsertae, pallide brunneae, 5 mm. longae. *Ovarium* 10-loculare, oblongum, glandulis subsessilibus dense indutum; stylus exsertus, robustus, 4·5 cm. longus, omnino glandulosus, stigmate capitato 4·5 mm. diametro coronatus. *Fructus* durus, 4 cm. longus, apice circiter 1·5 cm. crassus, leviter rugosus; pedicelli fructiferi 4 cm. longi.—*R. lucidum*, Franch. in Journ. de Bot. vol. ix. p. 300 (1895), fide Rehd. & E. H. Wils. l.c. *R. vernicosum*, Franch. l.c. vol. xii. p. 258 (1898). *R. Spooneri*, Hemsl. et E. H. Wils. in Kew Bull. 1910, p. 110.—J. HUTCHINSON.

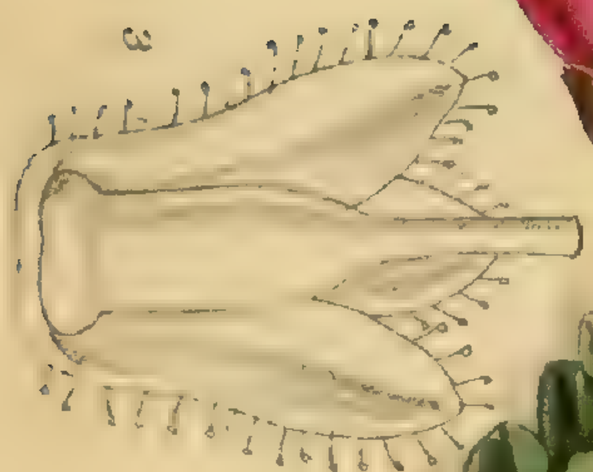
According to Mr. E. H. Wilson, *Rhododendron decorum* is widely distributed in Western China. First introduced by Delavay in 1887 through seeds from Mt. Tsong-chan, Yunnan, at 6700 feet, young plants were obtained for Kew from the Jardin des Plantes, Paris, in 1889. It was next met with by David at Mupine in Szechuan, and was found again in that region by Wilson. For a time it remained rare in collections, but has now become

plentiful, having been found by Forrest on the Lichiang and Tali ranges at 9,000–11,000 feet, within and on the margins of pine forests. The plant figured was raised from seed collected by Forrest and presented to Kew by Mr. J. C. Williams of Caerhays in 1911. *R. decorum* appears to vary considerably in colour of flower and in habit. The plants raised in France in 1888 were thin and rather gaunt; those of recent origin are more compact and promise to be attractive and hardy garden shrubs, in general facies resembling *R. Fortunei*, Lindl., figured at t. 5596 of this work, but with usually narrower coriaceous leaves and larger unspotted flowers, which are very fragrant.

DESCRIPTION.—*Shrub*, reaching 16 ft. in height; twigs stout, glabrous. *Leaves* oblong or oblong-elliptic, rounded at both ends or narrowed to the base, the apex bluntly mucronate, usually 3–5, at times up to 8 in. long, 1–2 in. wide, firmly leathery, glabrous on both sides and closely reticulate above; midrib slightly sunk above, raised beneath and gradually narrowing upwards; lateral nerves 9–12 on each side, leaving the midrib at an angle of about 70°, distinctly forked and raised on both surfaces; petiole $\frac{1}{3}$–$\frac{2}{3}$ in. long, stout, almost flat above, faintly keeled beneath. *Inflorescence* about 10-flowered, 8 in. across; pedicels stout, $1\frac{1}{4}$–$1\frac{1}{2}$ in. long, sparingly beset with almost sessile glands. *Calyx* well developed, cup-shaped, $\frac{1}{10}$–$\frac{1}{8}$ in. deep, sparingly glandular outside and round the undulate mouth. *Corolla* usually white, sometimes with a greenish tinge, sometimes flushed with rose; tube $1\frac{1}{4}$ in. long, glabrous; limb $3\frac{1}{4}$–$3\frac{1}{2}$ in. across, lobes 7, nearly orbicular, emarginate, about 1 in. broad. *Stamens* 16, filaments up to $1\frac{1}{4}$ in. long, sparingly puberulous below; anthers barely exserted, pale brown, $\frac{1}{5}$ in. long. *Ovary* 10-celled, oblong, densely covered with almost sessile glands; style exserted, stout, $1\frac{3}{4}$ in. long, glandular throughout; stigma capitate, over $\frac{1}{6}$ in. across. *Capsule* indurated, $1\frac{1}{2}$ in. long, about $\frac{2}{3}$ in. wide at the top, slightly rugose; pedicels in fruit about $1\frac{1}{2}$ in. long.

Fig. 1, apex of leaf; 2, calyx and pistil; 3, calyx, with section of ovary; 4 and 5, stamens; 6, anther; 7, transverse section of ovary:—*all enlarged.*





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Tab. 8660.

PENTSTEMON rupicola.

North America.

Scrophulariaceae. Tribe Cheloneae.

Pentstemon, *Mitch.*; *Benth. et Hook. f. Gen. Plant.* vol. ii. p. 940.

Pentstemon rupicola, *Howell, Fl. N.W. Amer.* p. 510, 1903; affinis *P. Newberryi*, A. Gray, sed sepalis oblongo-ellipticis subacutis haud acuminatis corolla ventricosa majore antheris haud vel vix exsertis apte distinguenda.

Herba basi ramosa caulibus ascendentibus junioribus dense puberulis superne plus minusve glandulosis. *Folia* ovata, apice acuta, basi cuneata, saepissime circiter 7 mm. longa et 5·5 mm. lata, margine serrata, crassiuscula costa et nervis indistinctis plus minusve ciliolatis. *Flores* ad ramorum apicem aggregati pedicellis 6 mm. longis glanduloso-pubescentibus; bracteae foliis similes nisi angustiores; bracteolae lanceolatae, acutae, 2 mm. longae, 1 mm. latae. *Sepala* oblongo-elliptica, acuta, 7 mm. longa, 3·5 mm. lata, utrinque leviter glandulosa. *Corolla* conspicue bilabiata, ventricosa, roseo-coccinea; tubus 2·5 cm. longus, basi 4 mm. diametro, 7 mm. supra basem constrictus, 3 mm. diametro, deinde ampliatus fauce 1 cm. diametro; labium anticum 1·2 cm. longum, 1·5 cm. latum, trilobum lobis lateralibus 5 mm. longis 4·5 mm. latis, lobo medio minore; labium posticum 1·2 cm. longum, 1·1 cm. latum, bilobum lobis 5 mm. longis 4–5 mm. latis. *Stamina* 4; filamenta 2 cm. longa; antherae liberae, dense comosae. *Staminodium* 1·5 cm. longum, inferne glabrum, superne barbatum. *Ovarium* cylindrico-ovoideum, 4 mm. altum, 2 mm. diametro, glabrum; stylus 2·7 cm. longus, glaber.—*P. Newberryi*, A. Gray, var. *rupicola*, Piper in Bull. Torr. Bot. Club, vol. xxvii. p. 397, 1900; Krautter in Contrib. Bot. Lab. Univ. Pennsylv. vol. iii. no. 2, p. 102, 1908.—W. B. Turrill.

This charming *Pentstemon* has recently found its way into cultivation in England, and we are indebted to Mr. C. Elliott, Six Hills Nursery, Stevenage, for the example figured. The plant was obtained by Mr. Elliott in 1910, and has been grown as *P. Davidsonii*, Greene. It is, however, very distinct from that Californian plant, being much more closely allied to *P. Newberryi*, A. Gray, a more northern species which has itself been by some authors treated as a form of *P. Menziesii*, Hook. The original material of *P. rupicola* came from dry rocky cliffs on Mt. Rainier, Washington, at 7500 feet above sea-level; with this Mr. Piper, who looked on the species as only a variety of *P. Neuberryi*, associated material collected by Mr. Allen on the Goat Mountains, also in Washington. Allen's plant agrees with that now figured in every respect,

even in having the staminode strongly bearded above, though in the hitherto published accounts of *P. rupicola* this is described as glabrous. To Mr. Howell we are indebted for the definite separation of *P. rupicola* from *P. Newberryi*, and although Mr. L. Krautter in his 'Comparative Study of the Genus Pentstemon' has reverted to Piper's arrangement, it seems more desirable to adopt that of Howell. Piper reports the occurrence on Mount Adams of a plant with the depressed habit and thick leaves of *P. rupicola*, but with the corolla of *P. Newberryi*. The place of *P. rupicola* in the genus is within Bentham's section *Erianthera*, on account of its dwarf habit, and its densely comose anthers which open longitudinally throughout their extent. At Kew *P. rupicola* has proved hardy in a sunny position in the rock garden facing south and grown under moraine conditions. It flowers in May, and, although it has failed to ripen its seeds, may be readily propagated by cuttings.

DESCRIPTION.—*Herb*, dwarf, prostrate and branching at the base; stems ascending above, densely puberulous and more or less glandular upwards. *Leaves* ovate, acute, base cuneate, usually about $\frac{1}{4}$ in. long and $\frac{1}{5}$ in. wide, margin serrate, rather thick, with the midrib and nerves more or less ciliolate, but otherwise barely distinguishable. *Flowers* clustered at the tips of the branches; pedicels $\frac{1}{4}$ in. long, glandular-pubescent; bracts like the leaves but smaller; bracteoles acute, $\frac{1}{12}$ in. long, $\frac{1}{24}$ in. wide. *Sepals* oblong-elliptic, acute, over $\frac{1}{4}$ in. long, $\frac{1}{7}$ in. wide, slightly glandular. *Corolla* distinctly 2-lipped, ventricose, rose-carmine; tube 1 in. long, $\frac{1}{6}$ in. wide below, narrowed to $\frac{1}{8}$ in. above the base, then widened upwards and $\frac{2}{5}$ in. wide at the throat; lower lip $\frac{1}{2}$ in. long, $\frac{2}{3}$ in. wide, 3-lobed, lateral lobes larger than the mid-lobe, $\frac{1}{5}$ in. long; upper lip 2-lobed, lobes $\frac{1}{5}$ in. long. *Stamens* 4; filaments $\frac{3}{4}$ in. long; anthers free, densely woolly; staminode $\frac{2}{3}$ in. long, glabrous below, bearded above. *Ovary* cylindric-ovoid, $\frac{1}{6}$ in. long, $\frac{1}{12}$ in. across, glabrous; style over 1 in. long, glabrous.

Fig. 1, leaf; 2, calyx and style; 3, calyx, laid open; 4, base of corolla, showing stamens and staminode; 5, anther; 6, staminode:—*all enlarged.*

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Tab. 8661.

CYTISUS ratisbonensis.

Siberia to Central Europe.

Leguminosae. Tribe Genisteae.

Cytisus, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. i. p. 484.

Cytisus ratisbonensis, *Schaeff. Bot. Exped.* (1760) tab. in lib. prim.; *Kerner Abh. Pflanzengest. Klima u. Boden*, p. 15; *Schneider, Laubholzk.* vol. ii. p. 50, figs. 32 k–o, 33 a–b; *Bean, Trees & Shrubs*, vol. i. p. 462; species a caeteris e grege *C. hirsuti*, Linn., ramis novellis calyce legumineque sericeo-pubescentibus distincta.

Fruticulus ramis vetustis e basi prostrata adscendentibus novellis erectis adpresse sericeo-pubescentibus. *Folia* petiolata; foliola obovato-oblonga vel obovata vel oblanceolata, supra glabra, subtus cinereo-sericeo. *Flores* in ramis annotinis solitarii vel saepius 2–3-nati longe racemose dispositi, 1·5–2 cm. longi. *Calyx* tubulosus, circiter 1 cm. longus, adpresse sericeus. *Corolla* lutea, vexillo glabro saepe maculo rubro-brunnescente ornato. *Legumen* lineari-oblongum, adpresse sericeum.—*C. ratisbonensis*, var. *vulgaris*, Aschers. & Graebn. Syn. Mitt. Eur. Fl. vol. vi. Abt. ii. p. 324. *C. hirsutus*, subsp. *ratisbonensis*, var. *ratisbonensis*, Briq. Étud. Cytis. Alp. Marit. p. 167.—O. Stapf.

A considerable interest attaches to the familiar and long-established garden plant which forms the subject of our illustration. Among the shrubby Brooms hardy with us there are few more attractive than this one, which has been in constant cultivation at Kew for at least seventy years, probably for a much longer period, and is still planted in quantity for the charming display which it gives every year when in flower in early May. This species appears to be the *Cytisus* figured at t. 308 of the Botanical Register as *C. biflorus*, where it is recorded as having been introduced from Hungary by Mr. James Gordon about 1760. The figure in question was based on a plant grown in the Cambridge Botanic Garden and agrees in all respects with typical *C. ratisbonensis* except in the absence of the reddish-brown blotch usually present on the standard of this species. The true *C. biflorus*, L'Herit., which has been considered by Ascherson and Graebner a variety of *C. ratisbonensis*, has flowers which are of a purer yellow and differs besides in its narrower

leaflets, longer and narrower calyx-tube, and more silvery indumentum. Yet another Hungarian form has been figured by Waldstein and Kitaibel (Pl. Rar. Hung. t. 166); this has pure yellow flowers and has been considered by Kerner a state of *C. ratisbonensis*; in reality, however, it approaches more closely to the true *C. biflorus*. Not impossibly these two Brooms, *C. ratisbonensis* and *C. biflorus*, are not always separable, the limits between them becoming obliterated either by crossing or from convergent fluctuations. The plant now figured may therefore be such an intermediate state which has become persistent in cultivation and given rise to a fairly characteristic garden form. In favourable conditions vigorous plants produce sprays over a foot long, covered with blossom. If given a loamy soil and a sunny situation it succeeds without further trouble; its abundant seed makes propagation easy. In the wild state *C. ratisbonensis* extends from Western Siberia through Central and Southern Russia, Silesia, Bohemia and Hungary to Southern Bavaria, while there is an isolated area in Thuringia. The material for our plate was provided by a plant in the collection of Leguminosae at Kew.

DESCRIPTION.—A small *shrub*, old branches ascending from a prostrate base, young shoots erect, adpressed silky-pubescent. *Leaves* distinctly stalked; leaflets obovate-oblong or obovate or oblanceolate, glabrous above, grey-silky beneath. *Flowers* $\frac{2}{3}$–$\frac{3}{4}$ in. long, produced singly or in twos or threes along the shoots of the previous season so as to form long racemose sprays. *Calyx* tubular, about $\frac{2}{5}$ in. long, adpressed silky. *Corolla* yellow, standard glabrous, in the wild plant often with a reddish-brown blotch which is usually absent in the garden form. *Pod* linear-oblong, adpressed silky.

Fig. 1, a flower, the petals removed; 2, wing petal; 3, keel petal; 4, portion of the staminal sheath; 5, pistil:—*all enlarged*.

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Tab. 8662.

ERIA tomentosa.

Indo-China.

Orchidaceae. Tribe Epidendreae.

Eria, *Lindl.*; *Benth. et Hook. f. Gen. Plant.* vol. iii. p. 509.

Eria tomentosa, *Hook. f. Fl. Brit. Ind.* vol. v. p. 803; aff. *E. ornatae*, Lindl., bracteis ovatis multo brevioribus floribus minoribus et labello latiore differt.

Herba epiphytica, rhizomate crasso lignoso; pseudobulbi inter se distantes, late ovoidei vel globoso-ovoidei, subcompressi, 4–6 cm. longi, 2–3-phylli. *Folia* breve petiolata, lanceolata vel elliptico-lanceolata, subacuta, coriacea, recurva, 9–22 cm. longa, 1·5–4 cm. lata. *Scapi* suberecti, 25–33 cm. longi, basi vaginis sat numerosis imbricatis vestiti, praesertim superne brunneo-tomentosi, multiflori; bracteae mediocres, ovatae vel ovato-lanceolatae, subobtusae, margine paullo reflexae, 1·5–2 cm. longae, parce pubescentes, pulchre rubro-aurantiacae; pedicelli 3–3·5 cm. longi, brunneo-tomentosi. *Flores* mediocres, extra brunneo-tomentosi. *Sepala* subconniventia; posticum oblongum, subobtusum, 1·3–1·5 cm. longum; lateralia subaequalia, basi dilatata, mentum breve formantia. *Petala* lineari-oblonga, subacuta, 1–1·1 cm. longa. *Labellum* recurvum, trilobum, 1·2–1·4 cm. longum; lobus intermedius obovatus, subobtusus, recurvus, undulatus; lobi laterales angusti, obtusi; discus obtuse tricarinatus, carinis crenulatis, *Columna* oblonga, 4 mm. longa. *Pollinia* 8, subglobosa.—*E. ornata*, Lindl. in Journ. Linn. Soc. vol. iii. p. 48, excl. syn., nec auct. ejusd. in Gen. & Sp. Orch. *Epidendrum tomentosum*, Koenig in Retz. Obs. vol. iii. p. 53.—R. A. Rolfe.

The striking *Eria* here figured is one for the material of which we are indebted to Sir F. W. Moore, by whom it was flowered in 1915 in the collection at Glasnevin, where it has been in cultivation since 1913, when it was purchased, with some other orchids, from Mr. Pauwels, Meiralbeke, Ghent, as a new importation not well established. After one or two trials it was found, Sir Frederick Moore informs us, to succeed best in the warm end of the intermediate house, with a night temperature not falling below 58° F. Though the leaves are thick and leathery it appears to dislike too much sun. Straggling in growth, with pseudobulbs up to five inches apart and with spare, thin, wiry roots given off under each bulb, the plant is unsuited to pot-culture and does best suspended in a basket near the glass. The roots may be

bent backwards till they take hold in the soil. It requires a fair amount of rest when growth is completed and, in a basket, may be given abundance of water during the growing season. It evidently resents too low a temperature and too much direct sunlight. In the original basket there were apparently two distinct plants, one with the tomentum distinctly paler, but except in this character the two do not differ, and they must be regarded as merely forms of one species. The consignment of which this *Eria* formed part included a *Coelogyne* which on flowering proved to be *C. pachybulbon*, Ridl., a circumstance which indicates Siam as almost certainly the country of origin of this *Eria* also. As to the identity of the species figured there is no doubt; it agrees with the 'Indian' plant mentioned under *E. ornata*, Lindl., figured at t. 8642 of this work, as having been confused by Lindley with that Malayan species, but as having been afterwards distinguished therefrom by Hooker as *E. tomentosa* owing to its being the species originally described by Koenig as *Epidendrum tomentosum*. A comparison of the two illustrations will show that, as Hooker pointed out in 1890, *E. tomentosa*, now figured, has relatively shorter and broader bracts than *E. ornata* has. The flowers also differ in colour, and the leaves in the example depicted are narrower than those of *E. ornata*, though this last character does not hold good for all the dried specimens from which *E. tomentosa* has hitherto been somewhat imperfectly known. This species is only to be accounted an 'Indian' one because of its presence in the Khasia Hills which, however, lie east of the Brahmaputra and have a flora which is Indo-Chinese rather than Indian. Its other known localities, Chittagong, Tenasserim and now Siam, are Indo-Chinese, a fact which suggests that the Pungah plant obtained by Mr. Curtis, also mentioned under t. 8642 of this work, may belong to *E. tomentosa*, which we may perhaps regard as the geographical representative in Indo-China of the Malayan *E. ornata*.

DESCRIPTION.—*Herb*, epiphytic; rootstock stout, woody; pseudobulbs remote, wide-ovoid or ovoid-globose, somewhat compressed, $1\frac{3}{4}$–$2\frac{1}{4}$ in. long, 2–3-leaved. *Leaves*

shortly stalked, lanceolate or elliptic-lanceolate, rather acute, coriaceous, recurved, $3\frac{1}{2}$–9 in. long, $\frac{2}{3}$–$1\frac{3}{4}$ in. wide. *Scapes* suberect, many-flowered, 10–13 in. long, base clothed with imbricate sheaths, brown-tomentose especially upwards; bracts medium-sized, $\frac{2}{3}$–$\frac{3}{4}$ in. long, ovate or ovate-lanceolate, rather blunt, their margins somewhat reflexed, sparingly pubescent, bright orange-red; pedicels $1\frac{1}{4}$–$1\frac{1}{2}$ in. long, brown-tomentose. *Flowers* medium-sized, brown-tomentose externally. *Sepals* somewhat connivent; the upper oblong, rather blunt, $\frac{1}{2}$–$\frac{2}{3}$ in. long; lateral subequal, dilated at the base and there forming a short mentum. *Petals* linear-oblong, somewhat acute, under $\frac{1}{2}$ in. long. *Lip* recurved, 3-lobed; mid-lobe obovate, rather blunt, recurved, undulate; lateral lobes narrow, blunt; disk bluntly 3-keeled, the keels crenulate. *Column* oblong, $\frac{1}{6}$ in. long. *Pollinia* 8, nearly globose.

Fig. 1, a flower, the sepals and lip removed; 2, lip; 3, anther-cap; 4, pollinia :—*all enlarged.*

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BOTANICAL MAGAZINE.

CONTENTS OF No. 138, JUNE, 1916.

TAB. 8663.—ALOE ARBORESCENS, VAR. NATALENSIS.

„ 8664.—SAXEGOTHAEA CONSPICUA.

„ 8665.—RHODODENDRON CHARIANTHUM.

„ 8666.—CAMPANULA ZOYSII.

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The Publishers trust that in the present circumstances the Subscribers will not be unwilling to acquiesce in this alteration. The two members of the staff who were previously concerned in the work of collating and despatching the magazine are both on active service at the front.

June, 1916.

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Tab. 8663.

ALOE arborescens, var. natalensis.

Natal.

Liliaceae. Tribe Aloineae.

Aloe, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. iii. p. 775.

Aloe arborescens, var. **natalensis**, *Berger in Engl. Pflanzenr., Asphodel.–Aloin.* p. 290; a typo foliis glaucis supra subplanis pedunculoque subsimplici differt.

Frutex altus, e basi multiramosus; rami erecti vel erecto-patentes. *Folia* ad ramorum apices dense congesta, e basi dilatata ensiformia, supra gradatim attenuata, reflexa vel subfalcatim deflexa, 45–50 cm. longa, 5 cm. lata, supra subplana, subtus convexa, glauca, ad apicem rubescentia, anguste cartilagineo-marginata; dentes hamato-incurvi, inferiores 4 mm. longi et inter se 10 mm. distantes, superiores 10–20 mm. distantes. *Pedunculus* erectus vel arcuato-erectus, robustus, 40–50 cm. altus, simplex vel ramo brevi laterali praeditus; racemus 20–25 cm. longus; bracteae steriles plures, late deltoideae; bracteae fertiles dense imbricatae, ovato-oblongae, obtusae, rubescentes, demum brunneae, scariosae. *Perianthium* 3·8–4·5 cm. longum; tubus rectus vel leviter curvatus, infra medium constrictus, ruber; segmenta 3–5-nervia, exteriora subacuta, interiora obtusa, viridia. *Stamina* breviter exserta.—*A. natalensis*, Wood & Evans in Journ. Bot. 1901, p. 170, and Natal Plants, t. 258; Schoenl. in Rec. Albany Mus. vol. i. p. 43 (1903). *A. arborescens*, Salm-Dyck, Monogr. Aloes, § 26, fig. 3; Baker in Journ. Linn. Soc. vol. xviii. p. 175, et in Dyer, Fl. Cap. vol. vi. p. 322, partim; Berger in Gartenwelt, vol. x. p. 13, cum icon. (1905).—C. H. Wright.

The typical form of *Aloe arborescens*, Mill., which was originally described in the eighth edition of the Gardeners' Dictionary, has long been known in cultivation and was figured at t. 1306 of this work. It is readily distinguished from all the five varieties which have at various times been associated with it in its arborescent habit, its trunk at times reaching a height of over twelve feet. Mr. Berger, who has recently subjected the genus to careful study, has retained the stemless or short-stemmed forms in *A. arborescens*, and has proposed for the original tall-stemmed plant the varietal name *Milleri*. The short-stemmed form now figured, which competent South African botanists seem disposed to consider a distinct species, Mr. Berger has treated as only a variety, var. *natalensis*, and Mr. Wright has accepted Berger's view. This variety has had a history quite as prolonged as that

of Miller's original plant. It is recorded as having been grown at Amsterdam by Adrian van der Stel as long ago as the beginning of the eighteenth century. It was first figured in the monograph published by Prince Salm-Reifferscheid-Dyck in 1817. It is distinguishable from Miller's plant not only in habit but in having the leaves almost flat instead of channelled near the middle on the upper side and in having the raceme, at least when young, conical rather than cylindric. The inner perianth-segments are sometimes yellowish. The material for our plate has been supplied from a plant grown in the garden of Lady Hanbury at La Mortola. As a wild plant our variety has been met with by the late Dr. Medley Wood at altitudes of 800–3,000 feet in Natal, and by Dr. S. Schoenland at an altitude of 1,000 feet in Komgha, always in rocky situations. The various varieties of *A. arborescens* are among the easiest of Aloes to cultivate. They grow vigorously in poor gravelly soil provided the position given be a sunny one in a warm house, and if they receive a fair allowance of water at the root in summer. One of the stemless varieties is very commonly grown as a window plant in country cottages.

DESCRIPTION.—*Shrub*, freely branching at the base; branches erect or slightly spreading. *Leaves* densely clustered at the tips of the branches, ensiform from a broad base, gradually narrowed upwards, reflexed or falcately deflexed, about $1\frac{1}{2}$ ft. long, 2 in. wide, nearly flat above, convex beneath, glaucous, reddish towards the tips, margin narrowly cartilaginous; teeth incurved-hooked, the lower $\frac{1}{6}$ in. long and $\frac{1}{3}$ in. apart, the upper $\frac{1}{2}$–$\frac{2}{3}$ in. apart. *Peduncle* erect or upcurved, stout, up to $1\frac{1}{2}$ ft. long, simple or at times with a short lateral branch; raceme 8–10 in. long; sterile bracts rather numerous, wide deltoid; fertile bracts closely imbricate, ovate-oblong, blunt, reddish, becoming brown and scarious. *Perianth* $1\frac{1}{2}$–$1\frac{3}{4}$ in. long; tube straight or slightly curved, narrowed below the middle, red; lobes 3–5-nerved, the outer somewhat acute, the inner blunt, green. *Stamens* slightly exserted.

Fig. 1, perianth; 2 and 3, stamens; 4, pistil:—*all enlarged.*

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Tab. 8664.

SAXEGOTHAEA conspicua.

Chile.

Taxaceae.

Saxegothaea, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. iii. p. 434; *Pilger in Engl. Pflanzenr.* vol. iv. Abteil. 5 (*Taxaceae*), p. 42.

Saxegothaea conspicua, *Lindl. in Journ. Hort. Soc.* vol. vi. (1851), p. 258 et *in Lindl. & Paxt. Flow. Gard.* vol. ii (1851–1852), p. 111, cum icon.; *C. Gay, Fl. Chil.* vol. v. p. 412; *DC. Prodr.* vol. xvi. pars ii. p. 497; *Masters in Gard. Chron.* 1887, vol. ii. p. 684, figs. 130, 131, et l.c., 1889, vol. v. p. 782, fig. 125; *Kent in Veitch Man. Conif.* p. 158, fig. 55; *Elwes & Henry, Trees of Great Brit. & Irel.* vol. vi. p. 1459; species unica.

Arbor ad 9 m. alta vel *frutex*, ramulis angulatis, novellis cortice pallide viridi tectis vetustis flavido-fuscis. *Folia* per 4–5 annos persistentia, linearia, mucronata, 6–10 mm. longa, 1·5–3 mm. lata, coriacea, supra saturate viridia, subtus linis binis latis stomatiferis albis notata, costa utrinque prominula, marginibus incrassatis. *Strobili masculi* e foliorum superiorum axillis orti, solitarii, cylindrici, basi squamarum ovatarum acutarum paribus binis suffulti, 4–6 mm. longi, brunnei. *Strobili feminei* ramulos terminantes, subglobosi, virides, 6–8 mm. longi; squamae inferiores steriles, caeterae ovuliferae, triangulari-ovatae, mucronatae, basi lata affixae, crassae, supra basin versus ovulum in fossa immersum solitarium gerentes; ovulum epimatio libero albido fere totum circumdatum. *Fructus* carnosus, globosus, muricatus, e squamis praeter apices induratos liberos connatis formatus, 1 cm. diametro demum inter squamas dehiscens. *Semina* cum quoque fructu circiter 6, rotundato-ovata, compressa, bimarginata, 4 mm. longa.—O. Stapf.

The interesting Coniferous genus *Saxegothaea* was first discovered by Mr. W. Lobb in 1846 in the Chilean province of Llanquihue, at the Bay of Coman about Lat. 42° S., and was named by Professor Lindley after H.R.H. the Prince Consort. It is further represented at Kew by specimens from the neighbourhood of Valdivia and from Chiloe, while Dr. Pilger records its collection by Mr. Dusén in Western Patagonia, though it is not clear that this means more than Southern Chile. As a cultivated plant *S. conspicua*, the only species of the genus, thrives best in the milder parts of the British Islands, and particularly in the west of Ireland. For the material for our figure we are indebted to the Marquess of Sligo in whose collection at Westport House, Mayo, it flowered freely in

1913. There are specimens between thirty and forty feet high at Strete Ralegh and Coldrenick. At Kew the species is very slow growing. A plant in the Taxad collection, although well furnished and to all appearance quite healthy, is only some four feet high, though it is now over thirty years old. It is the survivor of three plants once growing in close proximity, of which the two others were killed by the great frosts of February, 1895, when the thermometer fell nearly to zero F. on three successive nights. The survivor has never been in the least affected by frost since then. Cuttings of nearly ripe wood strike root quite freely if placed in a mildly heated frame and kept close. It thrives well in loamy moist soil, but like most Chilean trees and shrubs will no doubt succeed equally well in peat. The genus *Saregothaea* has recently been the subject of morphological study by Mr. Stiles, Mr. R. B. Thomson, Miss M. S. Young and others, and the opinion appears to be generally held that it forms a connecting link between the *Podocarpeae* and the *Araucarieae*, though a member of the former rather than of the latter group. Miss Young has called attention to the striking development of the nucellar tissue which protrudes through the micropyle where it expands to form a stigma-like knob. She also points out that in its early stages the ovule is perpendicular to the scale, and only becomes inverted as the result of later growth. A similar, but less conspicuous development of the nucellar tissue occurs in the *Araucarieae*, but is practically unknown among Angiosperms. The most closely allied genus is the Tasmanian *Microcachrys*, Hook. f., a fact of considerable interest from a geographical standpoint.

DESCRIPTION.—*Tree* 30–40 ft. high or at times a *shrub*; twigs angled, bark when young pale-green, when older tawny-yellow. *Leaves* persisting for 4–5 years, linear, mucronate, $\frac{1}{4}$–$\frac{1}{2}$ in. long, $\frac{1}{16}$–$\frac{1}{8}$ in. wide, coriaceous, dark green above, beneath with two broad, white stomatiferous lines, midrib rather prominent on both sides, margins thickened. *Male cones* in the axils of the uppermost leaves, solitary, cylindric, with two pairs of ovate acute basal scales, $\frac{1}{6}$–$\frac{1}{4}$ in. long, brown. *Female cones* at

the tips of the twigs, almost globose, green, $\frac{1}{4}$–$\frac{1}{3}$ in. long; lower scales barren, the others bearing ovules, triangular-ovate, mucronate, attached by a wide base, thick, each with a solitary ovule, sunk in a depression somewhat above the base; ovule almost surrounded by a free envelope. *Fruit* fleshy, globose, muricate, composed of scales which are connate except at their free hardened tips, over $\frac{1}{3}$ in. across, ultimately dehiscing between the scales. *Seeds* about 6 to each cone, rounded-ovate, compressed, 2-marginate, $\frac{1}{6}$ in. long.

Fig. 1, leaf; 2, male catkin; 3, anther; 4, part of female cone; 5, ovule with the free margins of the epimatium turned back; 6, ovule with one half of the integument removed, showing in the centre the nucellus with its stigma-like prolongation; 7, fruit; 8, seed:—*all enlarged except* 7, *which is of natural size.*

M.S del. J.N. Fitch

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Tab. 8665.

RHODODENDRON CHARIANTHUM.

Western China.

Ericaceae. Tribe Rhodoreae.

Rhododendron, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. ii. p. 599.

Rhododendron charianthum, *Hutchinson*; species nova *R. longistylo*, Rehd. et Wils., et *R. Davidsoniano*, Rehd. et Wils., affinis; ab illo foliis subtus dense glanduloso-punctatis, calyce vix evoluto, ab hoc corollis intra conspicue et dense rubro-maculatis, stylo inferne parce pubescente differt.

Frutex, parce ramosus; ramuli juniores foliati, graciles, apicem versus parce lepidoti, cortice brunneo longitudinaliter verruculoso obtecti. *Folia* oblanceolata vel oblanceolato-elliptica, apice obtuse mucronata, ad basin cuneato angustata, 2·5–5 cm. longa, 1–2 cm. lata, tenuiter coriacea, margine minute crenulata utrinque glandulis minimis aureis inter se 0·25–0·5 mm. distantibus ornata, ceterum glabra; costa infra prominens; nervi laterales utrinsecus 7–9, supra paulum elevati, infra prominuli; petioli 3–6 mm. longi, parce lepidoti. *Flores* 9–10 in corymbum terminalem subplanum circiter 9 cm. expansum dispositi; pedicelli graciles, 1–1·5 cm. longi, parce glandulosi. *Calyx* brevissimus, undulate lobulatus. *Corolla* rosea, intus dorso dense rubro-maculata; tubus late expansus, circiter 1 cm. longus, utrinque glaber; lobi 5, oblongi vel ovato-oblongi, apice rotundati, 1·5–2 cm. longi, circiter 1·3 cm. lati. *Stamina* 10, longe exserta; filamenta inferne pubescentia, plus minusve 2·5 cm. longa; antherae carmineae, 2·25 mm. longae. *Ovarium* breviter cylindricum, lepidotum, 5-loculare; stylus staminibus paullo longior, inferne minutissime pubescens vel fere glaber, stigmate capitato 1·5 mm. diametro coronatus. *Fructus* brevissimus, 1 cm. longus, minute lepidotus.—J. Hutchinson.

The beautiful Rhododendron here described is one of a group of closely allied species, some of which, such as *R. yunnanense*, Franch., figured at t. 7614 and *R. Davidsonianum*, Rehd. & Wils., figured at t. 8605 of this work, have already become favourites with the cultivators of the genus in this country. As regards its flowers the nearest ally of *R. charianthum* is the now familiar *R. yunnanense*, but our plant lacks the hairs on the surfaces and margins of the leaves which are a striking feature of the older species. In other respects *R. charianthum* is very closely related to *R. Davidsonianum* and to *R. longistylum*, another species described by Rehder and Wilson. From the latter our plant is readily disguished by its more densely glandular leaves; from the

former by the strikingly spotted flowers and the hirsute style. The material for our plate has been obtained from a plant raised at Kew from seeds received from the Arnold Arboretum early in 1909. This plant flowered for the first time four years later, in April, 1913. It appears to be perfectly hardy and thrives well in sandy loam and peat. Like its allies among the scaly-leaved Rhododendrons it can be increased by cuttings placed in gentle heat about the middle of August.

DESCRIPTION.—*Shrub*, sparingly branched; young shoots leafy, slender, sparingly scaly towards the top, bark brown, finely warted longitudinally. *Leaves* oblanceolate or elliptic-oblanceolate, bluntly mucronate, cuneately narrowed at the base, 1–2 in. long, $\frac{1}{3}$–$\frac{3}{4}$ in. wide, thinly coriaceous, margin finely crenulate, beset on both surfaces with very small discrete golden glands, otherwise glabrous; midrib raised beneath; lateral nerves 7–9 on each side, slightly raised above, distinct beneath; petiole $\frac{1}{8}$–$\frac{1}{4}$ in. long, sparingly scaly. *Flowers* 9-10 in a terminal rather flat corymb, $3\frac{1}{2}$ in. across; pedicels slender, $\frac{1}{3}$–$\frac{2}{3}$ in. long, sparingly glandular. *Calyx* very short, with a shallowly lobulate margin. *Corolla* rose-coloured, densely blotched with red spots within on the upper portion; tube widely open, about $\frac{1}{3}$ in. long, glabrous on both surfaces; lobes 5, oblong or ovate-oblong, rounded at the tip, $\frac{2}{3}$–$\frac{3}{4}$ in. long, about $\frac{1}{2}$ in. wide. *Stamens* 10, far exserted; filaments pubescent downwards, about 1 in. long; anthers carmine, about $\frac{1}{10}$ in. long. *Ovary* shortly cylindric, lepidote, 5-celled; style rather longer than the stamens, very finely pubescent or almost glabrous downwards; stigma capitate. *Capsule* very short, about $\frac{1}{3}$ in. long, finely lepidote.

Fig. 1, portion of upper surface of a leaf; 2, portion of lower surface of a leaf; 3, calyx and pistil; 4, scales from the ovary; 5 and 6, stamens; 7, transverse section of ovary:—*all enlarged.*

2
4
5
3
1

Tab. 8666.

CAMPANULA Zoysii.

North Italy and Austria.

Campanulaceae. Tribe Campanuleae.

Campanula, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. ii. p. 561.

Campanula Zoysii, *Wulf in Jacq. Coll.*, vol. ii. p. 122 (1788); *Reichb. Fl. Germ.* vol. xix. t. 1610, p. 113; *Gard. Chron.* 1896, vol. xx. p. 183, et 1905, vol. xxxviii. p. 228; species *C. cenisiae*, Linn., affinis sed caulibus foliisque fere glabris, corollis oblongo-tubulosis superne leviter angustatis, lobis conniventibus intus pilis albis horizontaliter patentibus instructis distincta.

Herba usque ad 9 cm. alta. *Folia* radicalia late ovata, circiter 9 mm. longa et 6 mm. lata, margine ciliato excepto glabra, petiolo circiter 1 cm. longo instructa; caulina oblanceolata, inferiora longe petiolata, superiora fere sessilia, apiculata, basi cuneata, petiolo excluso 1·1 cm. longa, 3 mm. lata, margine dentibus albis 2–4 instructa, costa pagina inferiore prominente, superiore indistincta, nervis lateralibus pagina utraque obscuris. *Racemi* terminales, 3–4-flori; bracteae foliis similes sed minores; bracteolae lineares, apiculatae, 2·5–4 mm. longae, margine integrae vel dentibus duobus albis instructae. *Receptaculum* tubinatum, 2 mm. altum, apice 3 mm. diametro, glabrum, 5-lobatum, lobis bisulcatis. *Sepala* 5, patentia, lineari-attenuata, apiculata, 4 mm. longa, basi 1 mm. lata, glabra, margine dentibus albis 2–4 instructa. *Corolla* oblongo-tubulosa, superne leviter angustata, loborum ex adverso angulata, 1·7 cm. longa; tubus 1·4 cm. longus, basi 7 mm. apice 5·5 mm. diametro, glaber; lobi 5, erecti, conniventes, triangulares, 3 mm. longi, 5 mm. lati, intus apice longe, inferne breviter, patente barbati. *Stamina* 5, filamentis 5 mm. longis glabris basi latissimis connatis, antheris 1·5 mm. longis. *Ovarium* typice triloculare, placentis axilibus; stylus 1·4 cm. longus, maturitate apice curvatus, albus.—W. B. Turrill.

This distinct and singular *Campanula* has a scattered distribution in the Eastern Alps. Specimens collected in Venetia, Carniola, Carinthia, Styria and Steiermark are preserved in the Kew Herbarium. It is at home on the limestone rocks of these provinces at an altitude of 6,500–9,000 feet above sea-level.

The peculiar shape of the corolla, with the tube constricted at the mouth and erect connivent barbate lobes, gives the flowers an appearance very different from those of typical Campanulas and one not at all bell-like. The corolla lobes are bent inwards to form a 5-sided pyramid, and their edges and tips touch. The hairs help to close in the edges, though these can be easily separated by insect visitants. When mature the end of the style is bent almost at right angles, and remains enclosed in the corolla. The anthers dehisce introrsely, and the pollen

covers the hairs which invest the capitate thickening formed by the immature style branches. The anthers then shrivel and are retracted into the base of the flower, while the style elongates and its end becomes bent. The young flowers are pendulous but become erect as they grow older. This *Campanula* has long been in cultivation at Kew, and the material for our plate has been derived from a plant in the Rock Garden. It is a hardy perennial, which grows well and flowers freely if given a sunny position, preferably in well-drained gravelly soil. It is readily propagated by cuttings as well as by its seeds which ripen fairly freely. The greatest difficulty connected with the cultivation of this species is its liability to be attacked by slugs, to which it seems to offer a peculiar attraction.

DESCRIPTION.—*Herb*, $3\frac{1}{2}$–4 in. in height. *Leaves*: radical broadly ovate, about $\frac{1}{3}$ in. long and $\frac{1}{4}$ in. broad, glabrous except for the ciliate margin; petiole about $\frac{1}{3}$ in. long; cauline oblanceolate, the lower long-petioled, the upper nearly sessile, apiculate, cuneate at the base, excluding the petiole nearly $\frac{1}{2}$ in. long and $\frac{1}{8}$ in. broad, with 2–4 white teeth on the margin, midrib prominent below, indistinct above, lateral nerves obscure on both surfaces. *Racemes* terminal, 3–4-flowered; bracts resembling the leaves but smaller; bracteoles linear, apiculate, $\frac{1}{10}$–$\frac{1}{6}$ in. long, margin entire or with two white teeth. *Receptacle* turbinate, $\frac{1}{12}$ in. high, $\frac{1}{8}$ in. in diameter at the apex, glabrous, 5-lobed, the lobes each with 2 furrows. *Sepals* 5, spreading, linear-attenuate, apiculate, $\frac{1}{6}$ in. long, glabrous, with 2–4 white teeth on the margin. *Corolla* oblong-tubular, slightly narrowed in the upper part, angular opposite to the lobes, about $\frac{2}{3}$ in. long; tube over $\frac{1}{2}$ in. long, over $\frac{1}{4}$ in. wide at the base, rather less at the apex, glabrous; lobes 5, erect, connivent, triangular, $\frac{1}{8}$ in. long, $\frac{1}{5}$ in. broad, bearded with long hairs at the apex within, with shorter hairs lower down. *Stamens* 5; filaments $\frac{1}{5}$ in. long, glabrous, very broad and connate at the base; anthers short. *Ovary* typically trilocular with axile placentas; style over $\frac{1}{2}$ in. long, curved at the apex when mature, white, glabrous.

Fig. 1, flower; 2, the same in longitudinal section; 3 and 4, stamens after dehiscence; 5, immature stigma:—*all enlarged.*

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BOTANICAL MAGAZINE.

CONTENTS OF Nos. 139, 140, 141, JULY, AUGUST, SEPTEMBER, 1916.

No. 139, July, 1916.

Tab. 8667.—PAEONIA WILLMOTTIAE.
„ 8668.—CIRRHOPETALUM CONCINNUM, var. PURPUREA.
„ 8669.—RHODODENDRON HANCEANUM.
„ 8670.—BRACHYSTELMA OIANTHUM.

No. 140, August, 1916.

Tab. 8671.—PANDANUS FURCATUS.
„ 8672.—VIBURNUM BETULIFOLIUM.
„ 8673.—EUPHORBIA CAPUT-MEDUSAE.
„ 8674A.—MESEMBRYANTHEMUM TRANSVAALENSE.
„ 8674B.—MESEMBRYANTHEMUM TUBERCULOSUM.

No. 141, September, 1916.

Tab. 8675.—RHODODENDRON MONOSEMATUM.
„ 8676.—URSINIA CAKILEFOLIA.
„ 8677.—LONICERA TATARICA.
„ 8678.—ACACALLIS CYANEA.

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Tab. 8667.

PAEONIA Willmottiae.

China.

Ranunculaceae. Tribe Paeonieae.

Paeonia, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. i. p. 10.

Paeonia Willmottiae, *Stapf*; species nova *P. obovatae*, Maxim., affinis sed foliolis majoribus exsiccando firmioribus subtus densius pilosis fere tomentosis magis glaucis, floribus candidis, antheris parvulis, carpellis an semper 5, stylis magis elongatis differt.

Herba perennis, caule glabro. *Folia* inferiora biternata; foliola lateralia oblique elliptico-ovata, breviter petiolulata, uno latere in petiolulo decurrentia, ea segmentorum lateralium basi inaequaliter in petiolulum decurrentia, terminalia elliptica vel obovato-elliptica, longiuscule petiolulata, omnia apice breviter contracta, superne obscure viridia et glabra, subtus glauca et purpureo-suffusa, undique pilis albis brevibus adpressis subtomentosa, majora ad 15 cm. longa, ad 8 cm. lata; petiolus et rhachis (saltem inferne) glabra; petioluli terminales 3–5 cm. longi, pilosuli; folia summa 3-foliolata, foliolis magis acuminatis. *Flores* aperti circiter 15 cm. diametro, pedicello glabro rubescente. *Sepala* 4, inaequalia, late oblonga, obtusa, valde concava, 2–3·5 cm. longa, 1·4–1·7 cm. lata, glaberrima, laete viridia. *Petala* circiter 10, rotundata vel obovata, concava, interiora multo angustiora, candida. *Stamina* numerosissima; filamenta purpurea, 1 cm. longa; antherae aureae, ad 4 mm. longae. *Carpella* 5, a latere visa lanceolata, glaberrima, viridia, sensim in stylum rubrum conicum abeuntia, eo incluso ultra 2 cm. longa; stigmata a latere valde compressa, revoluta. *Folliculi* oblique oblongo-ellipsoidei, ultra 2 cm. longi, 1·2 cm. diametro, stylo 5–7 mm. longo stigmateque uncinato-revoluto coronati. *Semina* fere obovoidea, circiter 8 mm. longa, 5·5–7 mm. lata, testa atra.—O. Stapf.

The Paeony here described was raised, from seed received from China, in the garden of Miss Willmott, of Warley Place, Essex, to whom we are indebted for the material for our plate. The history of that seed is somewhat obscure. The plant appeared in a pan in which some Chinese seeds collected by Mr. E. H. Wilson had been sown. As it seemed in the seedling stage unlike any other species in the collection at Warley, it was pricked off by itself and kept under observation until it should flower. When planted out it was placed in the collection next to *P. obovata*, Maxim., which had been raised from seed obtained in Manchuria, and seemed to be its nearest ally in the genus. That *P. Willmottiae*, now described, approaches *P. obovata* is evident, but it is readily distinguished by its larger leaflets,

glaucous and almost tomentose beneath, by its white flowers, those of *P. obovata* being red, and by its pistils, which considerably exceed the relatively short anthers. Chinese specimens of *P. Willmottiae* in the herbarium at Kew include two gatherings by Mr. A. Henry from Patung and Hsinghan, in Hupeh, which show that in the wild state its flowers are white. What appears to be the same species has been collected by Père Farges at Tchan-keou in Szechuan; it has also been met with in the same province by Mr. E. H. Wilson at Fang, where it is common in woods. The plant has thriven well at Warley Place in an ordinary well-drained border, and gives promise of being quite hardy.

DESCRIPTION.—*Herb*, perennial; stem glabrous. *Leaves* twice ternate, except the uppermost; lateral leaflets obliquely elliptic-ovate, shortly petiolulate, decurrent on the lower side on the petiolule, terminal elliptic or obovate-elliptic, with longer petiolules, all shortly contracted at the apex, dull green and glabrous above, glaucous, flushed with purple and uniformly sparingly tomentose with short white hairs beneath, the larger up to 6 in. long, 3 in. wide; petiole and rachis, at least of the lowest leaves, quite glabrous; terminal petiolules $1\frac{1}{4}$-2 in. long, slightly pilose; upper leaves 3-foliolate, the leaflets rather more acuminate. *Flowers* when fully open about 6 in. across; pedicel glabrous, reddish. *Sepals* 4, unequal, wide oblong, obtuse, very concave, $\frac{3}{4}$–$1\frac{1}{3}$ in. long, nearly $\frac{2}{3}$ in. wide, quite glabrous, bright green. *Petals* about 10, rounded or obovate, concave, the inner much narrower, all pure white. *Stamens* very many; filaments purple, over $\frac{1}{3}$ in. long; anthers golden-yellow, about $\frac{1}{6}$ in. long. *Carpels* usually 5, lanceolate as seen from the side, quite glabrous, green, gradually contracted into a conical red style; including the style about $\frac{7}{8}$ in. long; stigma, as seen from the side, much compressed, revolute. *Follicles* obliquely oblong-ellipsoid, about $\frac{7}{8}$ in. long, $\frac{1}{2}$ in. across, crowned by the $\frac{1}{4}$ in. long style, and the uncinately revolute stigma. *Seeds* nearly obovoid, about $\frac{1}{3}$ in. long, under $\frac{1}{4}$ in. wide; testa black.

Figs. 1 and 2, anthers; 3, anther, nearly ripe; 4, carpel:—*all enlarged.*

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Tab. 8668.

CIRRHOPETALUM concinnum, var. purpurea.

Malay Peninsula.

Orchidaceae. Tribe Epidendreae.

Cirrhopetalum, *Thouars*; *Benth. et Hook. f. Gen. Plant.* vol. iii. p. 504.

Cirrhopetalum concinnum, *Hook. f. Fl. Brit. Ind.* vol. vi. p. 190, *et in Hook. Ic. Plant.* t. 2060, fig. B; var. **purpurea**, Ridl., varietas a *C. concinno* typico planta majora, floribus omnino roseo-purpureo-suffusis, sepalis brevioribus latioribus et labello abrupte recurvo differt.

Herba epiphytica; pseudobulbi ovoideo-oblongi, monophylli, circiter 1 cm. longi, vaginis membranaceis vestiti. *Folia* oblonga vel elliptico-oblonga, obtusa, basi subattenuata, coriacea, 8–12 cm. longa, 3–4 cm. lata. *Scapi* floriferi ad basin pseudobulborum producti, graciles, suberecti, 6–8 cm. longi; umbellae multiflorae; bracteae ovato-lanceolatae, acuminatae, 4–5 mm. longae. *Flores* parvi, roseo-purpurei. *Sepala*: posticum ovato-ellipticum, valde concavum, apice setaceo-acuminatum, 0·5 cm. longum, margine longe ciliatum; lateralia fere ad apicem connata, late oblonga, apice subacuta et recurva, 1–1·3 cm. longa. *Petala* late ovata, subacuta, 3·5–4 mm. longa, margine longe ciliata. *Labellum* recurvum, carnosum, ovato-oblongum, acutum, 3·5–4 mm. longum, margine integrum. *Columna* oblonga, 2 mm. longa, margine membranacea, dentes minuti obtusi.—*Bulbophyllum pulchellum*, Ridl., var. *purpureum*, Ridl. Mat. Fl. Malay Penins. vol. i. p. 83.—R. A. Rolfe.

Cirrhopetalum concinnum was originally based on Singapore material collected by Mr. H. N. Ridley, late Director of the Singapore Botanic Garden. Sir Joseph Hooker regarded it as an ally of *C. Roxburghii*, Lindl., an imperfectly-known species from the Gangetic Delta. Mr. Ridley, who refers *Cirrhopetalum* to a section of *Bulbophyllum*, afterwards described it as *Bulbophyllum pulchellum*, Ridl., citing *C. concinnum* as a synonym. According to him the species is found also in Johor and Selangor, on the Malay Peninsula, and is very variable. At the same time he added the varieties *purpurea* and *brachypetala*, the former from Penang Hill and the islands south of Singapore, and the latter, which he remarks may be a distinct species, from the Langkawi Islands. The plant here figured was sent to Kew from Kuala Lumpur, Malay Peninsula, by Mr. E. Seimund, and flowered in the collection in May, 1915, when it was

recognized by Mr. Ridley as his var. *purpurea*. It differs from the type in having flowers of a uniform bright rose-purple, in having broader lateral sepals, and in being a somewhat larger plant. On the whole it seems most nearly allied to *C. gamosepalum*, Griff., another very variable species, but is smaller in all its parts. The plant thrives in a tropical house under conditions and treatment suitable for other species of the genus *Cirrhopetalum*.

DESCRIPTION.—*Herb*, epiphytic; pseudobulbs ovoid-oblong, 1-foliate, about $\frac{1}{3}$ in. long, clothed with membranous sheaths. *Leaves* oblong or elliptic-oblong, obtuse, somewhat narrowed at the base, coriaceous, 3–5 in. long, $1\frac{1}{4}$–$1\frac{3}{4}$ in. wide. *Scapes* produced at the base of the pseudobulbs, slender, suberect, $2\frac{1}{2}$–3 in. long; umbels many-flowered; bracts ovate-lanceolate, acuminate, $\frac{1}{8}$ in. long. *Flowers* rather small, rose-purple. *Sepals*: the posterior ovate-elliptic, very concave, with a setaceous-acuminate tip, $\frac{1}{5}$ in. long, margin ciliate-fringed; lateral connate almost to the tip, wide oblong, tip subacute and recurved, about $\frac{1}{2}$ in. long. *Petals* wide ovate, subacute, about $\frac{1}{6}$ in. long, margin ciliate-fringed. *Lip* recurved, fleshy, ovate-oblong, acute, about $\frac{1}{6}$ in. long, margin entire. *Column* oblong, $\frac{1}{12}$ in. long, margin membranous, teeth minute, blunt.

Fig. 1, a flower; 2, petal; 3, lip and column; 4, lip; 5, anther-case; 6, pollinia:—*all enlarged*.

M.S. del. J.N.Fitch lith.

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Tab. 8669.

RHODODENDRON Hanceanum.

Szechuan.

ERICACEAE. Tribe RHODOREAE.

RHODODENDRON, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. ii. p. 599.

Rhododendron Hanceanum, *Hemsl. in Journ. Linn. Soc.* vol. xxvi. p. 24 (1889); *Hemsl. et E. H. Wils. in Kew Bull.* 1910, p. 115; *Rehder et E. H. Wils. in Sargent, Pl. Wilsonianae*, vol. i. p. 517 (1913); *Bean, Trees & Shrubs*, vol. ii. 360, *et in Kew Bull.* 1914, p. 202, cum icon; affinis *R. ambiguo*, Hemsl., sed calyce semper bene evoluto differt.

Frutex parvus usque ad 1 m. altus; ramuli breves, nigro-punctati, demum longitudinaliter verrucosi, apicem versus foliati. *Folia* ovato-lanceolata vel elliptico-lanceolata, basi obtusissima vel rotundata, apice sensim et acute acuminata, 4–8 cm. longa, 1·5–3·5 cm. lata, rigide coriacea, supra viridia, impresse reticulata et nigro-punctata, infra pallida et minute lepidota; costa supra impressa, infra prominens; nervi laterales utrinsecus 8–9, prominenter conjuncti, utrinque prominuli; petioli 5–7 mm. longi, crassi. *Inflorescentia* breviter racemosa, 6–9-flora; perulae oblongo-ovatae, acute acuminatae, circiter 7 mm. longae et 5 mm. latae, rubescentes, glabrae; bracteae lineari-spatulatae, circiter 1·5 mm. longae, superne ciliatae; pedicelli 1 cm. longi, lepidoto-glandulosi. *Flores* flavo-albi. *Calycis* lobi oblongi, apice rotundati, 4–6 mm. longi, 1·5–2·5 mm. lati, membranacei, margine lepidoti vel ciliati. *Corolla* tubulosa, 5-loba; tubus 1–1·5 cm. longus, glaber; lobi ovato-oblongi, apice rotundati, 0·8–1 cm. longi. *Stamina* 10, longe exserta; filamenta valde inaequalia, usque ad 3 cm. longa, inferne pilosa; antherae carmineae, 3–5 mm. longae. *Ovarium* 5-loculare, cylindricum, dense lepidotum; stylus filamentis aequilongus, gracilis, glaber, stigmate capitato 2 mm. diametro coronatus. *Fructus* brevissimus, 0·8 cm. longus, arcte lepidotus, calyce persistente circumdatus, styli basi persistente coronatus.—J. HUTCHINSON.

This dwarf *Rhododendron* is a native of Szechuan in China, and was originally met with by the Rev. E. Faber on Mt. Omei in 1887. The plant figured was raised from seed collected by Mr. E. H. Wilson in Western China in 1908, and presented to Kew by the Arnold Arboretum; this plant agrees well with the type from Mt. Omei. According to Rehder and Wilson the leaves vary from obovate to lanceolate or lanceolate-ovate in shape, from shining to dull green above, and from densely to sparingly lepidote. In cultivation it varies in colour, of flower in different plants from creamy white to yellow. A notable characteristic of the plant is the hard stiff texture of its foliage. This species in its native habitat

is locally plentiful, forming dense dwarf thickets. So far as may be judged from its behaviour in cultivation, *R. Hanceanum* is quite hardy. It thrives well in a peaty soil or in sandy loam with leaf-mould, and flowers in March or April, according to the season. Among the forms grown in gardens as *R. Hanceanum* is one treated by Rehder and Wilson as belonging to the type, which has smaller leaves than in the Mt. Omei plant, more obovate and rounded at the tip; the style in this is slightly hairy at the base. This form appears at least a well-marked variety; with fuller material it may even prove a distinct species.

DESCRIPTION.—*Shrub*, dwarf or up to 3 ft. high; twigs short, dark punctate, ultimately longitudinally warted, leafy towards the top. *Leaves* ovate-lanceolate or elliptic-lanceolate, base very blunt or rounded, tip gradually acutely acuminate, $1\frac{3}{4}$–3 in. long, $\frac{2}{3}$–$1\frac{1}{3}$ in. wide, firmly coriaceous, above green, dark punctate with sunk venation, pale and finely lepidote beneath; midrib impressed above, raised beneath; lateral nerves 8–9 along each side, distinctly looped, rather raised on both surfaces; petiole about $\frac{1}{4}$ in. long, stout. *Inflorescence* shortly racemose, 6–9-flowered; bud-scales oblong-ovate, acutely acuminate, about $\frac{1}{4}$ in. long and $\frac{1}{5}$ in. wide, reddish, glabrous; bracts linear-spathulate, about $\frac{2}{3}$ in. long, ciliate upwards; pedicels $\frac{1}{3}$ in. long, glandular-lepidote. *Flowers* yellowish-white. *Calyx* 5-lobed; lobes oblong, rounded at the tip, $\frac{1}{6}$–$\frac{1}{4}$ in. long, $\frac{1}{12}$–$\frac{1}{10}$ in. wide, membranous, margin lepidote or ciliate. *Corolla* tubular, 5-lobed; tube $\frac{1}{3}$–$\frac{2}{3}$ in. long, glabrous; lobes ovate-oblong, rounded at the tip, about $\frac{1}{3}$ in. long. *Stamens* 10, far exserted; filaments very unequal, the longest about $1\frac{1}{4}$ in. long, pilose below; anthers carmine, $\frac{1}{7}$ in. long. *Ovary* 5-celled, cylindric, densely lepidote, style as long as the filaments, slender, glabrous; stigma capitate, $\frac{1}{12}$ in. wide. *Fruit* $\frac{1}{3}$ in. long, closely lepidote, encompassed by the persistent calyx and tipped by the persistent style-base.

Fig. 1, upper surface of leaf showing the black spots; 2, lower surface of same, and enlarged scales; 3, calyx and pistil; 4, enlarged ovary and part of calyx; 5, stamens; 6, transverse section of ovary:—*all enlarged.*

M.S. del. J.N. Fitch lith

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L. Reeve & Co. London.

Tab. 8670.

BRACHYSTELMA oianthum.

South Africa.

Asclepiadaceae. Tribe Ceropegieae.

Brachystelma, *R. Br.*; *Benth. et Hook. f. Gen. Plant.* vol. ii. p. 781.

Brachystelma oianthum, *Schlechter in Engl. Jahrb.* vol. xx. Beibl. 51, p. 53; *N. E. Br. in Dyer, Fl. Cap.* vol. iv. sect. i. p. 838; species *B. campanulato*, N. E. Br., valde affinis, sed corolla pilis longis albis vel atropurpureis instructa, lobis haud ciliatis distinguitur.

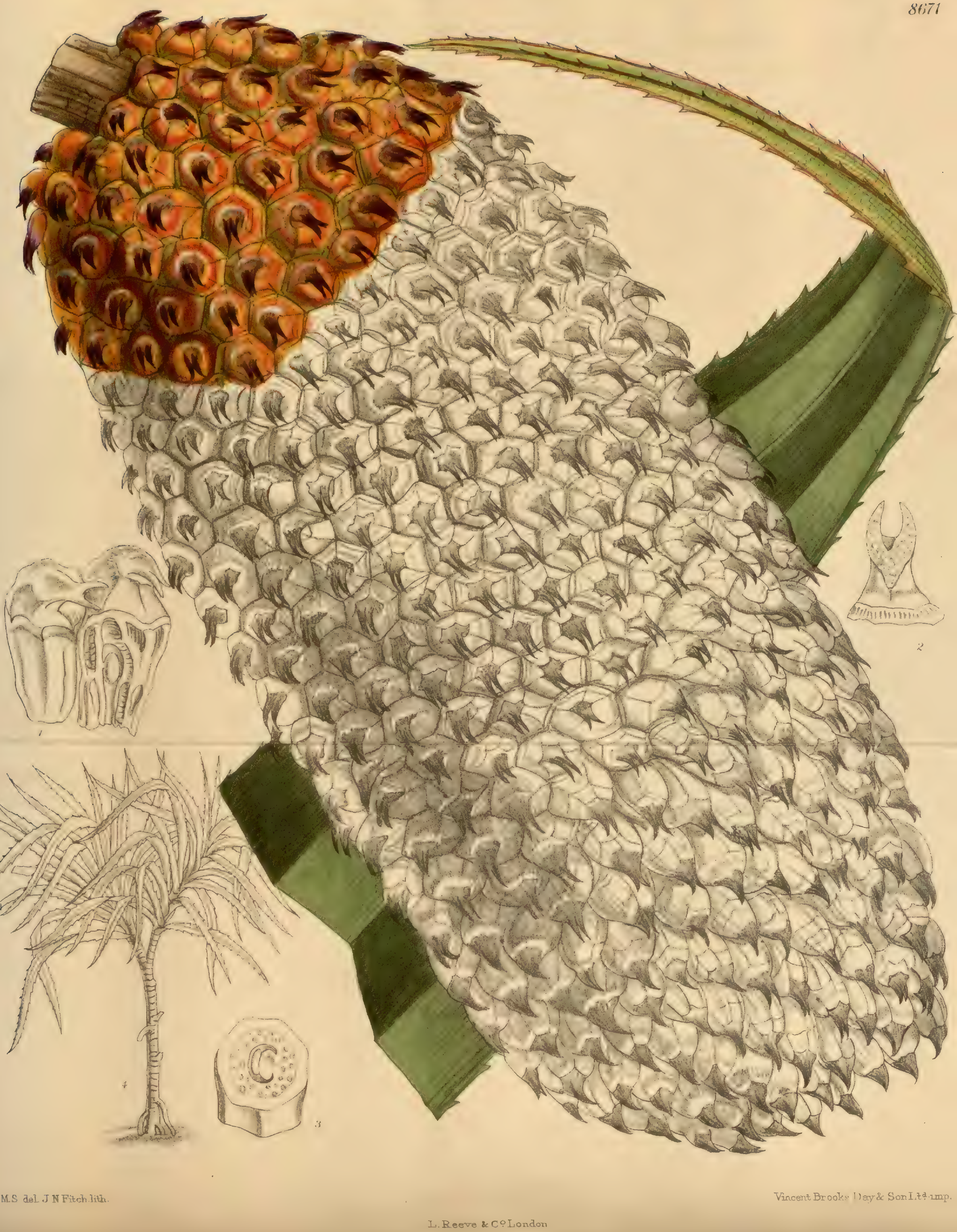
Herba tuberosa; tuber planum, circiter 5 cm. diametro; caulis erectus, simplex vel sparse ramosus, pubescens. *Folia* lanceolata, elliptico-lanceolata vel elliptico-oblanceolata, acuta, 1·25–5 cm. longa, fere 2 cm. lata, breviter petiolata, minute ciliata, plus minusve pubescentia. *Flores* solitarii, nutantes vel horizontales. *Calycis* segmenti lanceolati vel ovato-lanceolati, acuti, 5 mm. longi, sparse pubescentes. *Corolla* ovoideo-campanulata, breviter 5-loba, extra glabra, viridi-flava, maculis atropurpureis instructa; tubus ad 2·4 cm. longus (saepissime brevior) et 2·5 cm. diametro, intus pilis longis albis vel atropurpureis instructus; lobi 5, deltoidei, acuti, circiter 5 mm. longi et 5 mm. lati, longe ciliati. *Coronae* segmenti quinque, in cupulam connati, trilobi, lobis lateralibus (exterioribus) 10 deltoideis obtusis, lobis intermediis (interioribus) 5 ad antherarum dorsa adpressis, ea haud excedentibus.—W. B. Turrill.

The *Brachystelma* here figured is a native of the Orange River Colony, which has been in cultivation in England since 1912, when it was presented to Kew by Dr. R. Marloth, Cape Town. During the period which has elapsed since it was received all its parts have increased in size to a considerable extent. The leaves are now longer and wider and less hirsute than they were during its first season, and the flowers, produced for the first time in May, 1915, are much larger than those in any of the wild specimens from its native habitat in the Kew collection or in those on which Dr. Schlechter based his original account of *B. oianthum*. The species thrives well in a warm greenhouse under the conditions as to soil and water which are suitable for the South African species of *Stapelia*. The species of the genus *Brachystelma* display considerable variety in the shape of the corolla. The majority are without a distinct corolla-tube, the flower then being saucer-shaped or quite flat. The other

extreme is exemplified in *B. oianthum*, with its ovoid-campanulate or subglobose corolla. Between the two limits an almost unbroken series of intermediate conditions may be met with. In the species figured the structure of the corona is peculiar: the lobes are in two series, but unite to form a cupule apparently composed of five broad 3-lobed segments. What appear to be the lateral lobes of each segment really represent the constituents of a 10-lobed outer corona, while the five intermediate lobes represent the inner corona, the members of which are opposite to and closely applied to the back of the corresponding anthers. The ten lateral lobes are contiguous in pairs which alternate with the intermediate lobes, and may thus owe their origin to fission of five outer corona-lobes alternate with the five inner ones.

DESCRIPTION.—*Herb*; tuber flat, about 2 in. across; stem erect, simple or sparingly branched, pubescent. *Leaves* lanceolate, elliptic-lanceolate or elliptic-oblanceolate, acute, $\frac{1}{2}$–2 in. long, nearly $\frac{3}{4}$ in. wide, short-petioled, minutely ciliate, more or less pubescent. *Flowers* solitary, nodding or horizontal. *Calyx* 5-lobed; segments lanceolate or ovate-lanceolate, acute, $\frac{1}{5}$ in. long, sparingly pubescent. *Corolla* ovoid-campanulate, shortly 5-lobed, glabrous outside, greenish-yellow with dark purple spots; tube sometimes nearly 1 in. long, usually shorter, 1 in. wide, beset inside with long white or dark purple hairs; lobes 5, deltoid, acute, about $\frac{1}{5}$ in. long and wide, long-ciliate. *Corona* of 5 segments united in a cupule, each segment 3-lobed, the 10 lateral lobes representing an outer series deltoid obtuse, the 5 intermediate lobes representing an inner series adpressed to the backs of, and not longer than, the anthers.

Fig. 1, bud; 2, corolla in longitudinal section; 3, a single corolla-lobe; 4, corona and gynostegium; 5, pollen-masses:—*all enlarged except* 2, *which is of natural size.*



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M.S. del. J.N.Fitch lith.

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Tab. 8671.

PANDANUS furcatus.

India.

Pandanaceae.

Pandanus, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. iii. p. 949; *Warburg, Pandanaceae in Engl. Pflanzenreich*, vol. iv. pars 9, p. 43.

Pandanus furcatus, *Roxb. Hort. Beng.* p. 71 (nomen nudum); *Fl. Ind. ed. Carey*, vol. iii. p. 744; *Miq. Anal. Bot. Ind.* vol. iii. p. 10, tab. ii.; *Fl. Ind.-Bat.* vol. iii. p. 162, tab. 37; *Carrière in Rev. Hort.* 1879, p. 290, cum icon. col.; *Solms-Laubach in Linnaea*, vol. xlii. p. 13; *Hook f. Fl. Brit. Ind.* vol. vi. 484; *Warburg*. l. c. p. 75, figs. 21 A–C, ex parte; *Martelli in Webbia*, vol. iv. pars i. p. 15, tab. 29, figs. 5–8; inter species sectionis *Rykiae* syncarpia solitaria et stylos furcatos possidentes drupis cylindraceis apice late pyramidatis stylis longiusculis depressis haud alte furcatis distinctus.

Arbor 3–4 m. (rarius ad 10 m.) alta, superne parce divaricato-ramosa, basi radices aerias crassas trunco subadpressas emittens, cortice leviter annulato cinereo radicum cicatricibus notato. *Folia* linearia, longe tenuiter acuminata, 3–5 m. longa, 5–10 cm. lata, coriacea, ad margines spinis 3–4 mm. longis basi latis complanatis armata, tessellato-venosa. *Inflorescentia* ♂ terminalis, pendula; spadices cylindrici, spathis longioribus late lanceolatis breviter acuminatis aureis coriaceis spinoso-marginatis suffulti, spicatim dispositi. *Stamina* 9–13, monadelpha, filamentis liberis brevibus, antheris cuspidatis. *Spadix* ♀ solitarius vel pauci racemose dispositi, floribus ad pistilla reductis densissime onusti. *Ovarium* cylindricum, apice rotundatum, stylo sursum depresso breviter furcato. *Syncarpium* oblongum vel ellipsoideo-oblongum, 15–45 cm. longum, fusco-aurantiacum vel croceo-rubescens, carnoso-fibrosum. *Drupae* connatae, 5–6-gono-cylindraceae, vertice pyramidato-convexo stylo osseo-indurato spinoso nitenti fusco coronato.—*P. horridus*, Bl. Cat. Jav. Buitenz. p. 111. *P. Houlletii*, Carr. in Rev. Hort. (1868), p. 212. *P. spinifructus*, Dennst. Schluess. Hort. Malab. p. 27. *P. D'Haenei*, Kew Hand-List Tender Monocots, ed. 2 (1915), p. 181, vix Le Coq, Rev. Hort. Belg. vol. x. (1884), p. 234, fig. 22. *Rykia furcata*, de Vriese in Versl. Akad. Wet. vol. ii. (1854), p. 203, et Hook. Journ. Bot. vol. vi. (1854), p. 268.—O. Stapf.

The Screw Pine here figured is one which was purchased for the Kew Collection in 1888 from Mr. A. d'Haene, nurseryman, Ghent, as *P. D'Haenei*, Le Coq, said to be a species introduced from Madagascar by means of seeds obtained by Mr. L. Humblot prior to 1884. It has been in cultivation at Kew, since its acquisition, in the Palm House along with other species of the genus, and although it never quite resembled the plant of which a figure has been given by Mr. Le Coq, it

situation it grows well, and it can be increased quite easily either by seeds or by cuttings. *V. betulifolium* belongs to a group of closely allied red-fruited species from China, and is most nearly related to *V. lobophyllum*, Graebner, nor is it easy to find constant characters to separate the two plants. The best probably is the shape of the nut, which in *V. betulifolium* is smaller and nearly circular in outline, in *V. lobophyllum* ovate, tapering to a point at one end and more deeply grooved. The leaves of *V. lobophyllum*, also, are more uniformly rounded at the base and less deeply toothed. We do not find that the relative lengths of the style and calyx-lobes, the length of the peduncles or the pubescence of the leaves, afford reliable characters.

DESCRIPTION.—*Shrub* of bushy habit, probably 4 to 6 ft. high; young wood purplish-brown, glabrous. *Leaves* ovate and ovate-oblong to broadly rhomboid, acute or acuminate, usually broadly cuneate, sometimes rounded at the base, coarsely dentate in the terminal two-thirds, $1\frac{1}{2}$–$5\frac{1}{4}$ in. long, 1–$3\frac{1}{4}$ in. wide; main veins in 4–6 pairs running out to the tips of the teeth; dark green above and glabrous except for a line of stellate pubescence when young on the midrib and chief veins; pale beneath, with tufts of stellate pubescence in the vein-axils and on the midrib and veins: by the time the fruit is ripe the leaves are nearly or quite glabrous; petioles $\frac{1}{3}$–1 in. long, at first pubescent and furnished near the base with two small subulate stipules $\frac{1}{8}$ in. long. *Corymbs* terminal, 7-rayed, 2–$4\frac{1}{2}$ in. wide; peduncles $\frac{1}{4}$–1 in. long, glabrous or slightly pubescent, subdivided three or four times. *Flowers* white, crowded, $\frac{3}{16}$ in. wide; pedicels glandular, $\frac{1}{8}$ in. long. *Calyx* minute, its five lobes sparingly ciliate. *Corolla* 5-lobed; lobes orbicular. *Stamens* 5, longer than the corolla; *anthers* yellow. *Ovary* glandular; style about twice as long as the calyx-lobes. *Fruit* a red globose drupe, $\frac{1}{4}$ in. wide; stone compressed, roundish.

Fig. 1, flowers; 2, calyx and pistil; 3, stamens:—*all enlarged.*

lanceolate, shortly acuminate, coriaceous, with spines along the margins. *Stamens* 9–13, monadelphous, with the free portion of the filaments very short; anthers cuspidate. *Female spadix* solitary, or a few spadices together racemosely arranged, densely beset with numerous individual flowers reduced to simple pistils. *Ovary* cylindric, rounded at the tip; style depressed and shortly 2-furcate towards the tip. *Cone* oblong or ellipsoid oblong, 6–18 in. long, orange-brown or reddish-yellow, fleshy and fibrous. *Drupes* connate, nearly cylindric but slightly 5–6-angled, with a pyramidal-convex apex, crowned by the bone-hard 2-spinous style.

Fig. 1, immature fruits; 2, style and stigma; 3, section through the ovary; 4, sketch of the entire plant:—*all enlarged except* 4, *which is much reduced.*

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M.S. del. J.N. Fitch Lith.

Vincent Brooks, Day & Son, Lith. Imp.

L. Reeve & Co. London

Tab. 8672.

VIBURNUM BETULIFOLIUM.

Central China.

CAPRIFOLIACEAE. Tribe SAMBUCEAE.

VIBURNUM, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. ii. p. 3.

Viburnum betulifolium, *Batalin in Act. Hort. Petrop.* vol. xiii. p. 371 (1894); *Rehder in Sargent, Trees & Shrubs*, vol. ii. p. 99, t. 147 (1908); *C. K. Schneider, Handb. der Laubolzk.* vol. ii. p. 648; *Bean, Trees & Shrubs*, vol. ii. p. 643 (1914); species *V. lobophyllo*, Graebner, quam maxime affinis, foliis basi saepissime cuneatis margine altius dentatis, pyrenis minoribus compresso-rotundatis obtusis nec ovoideis subacutis distincte sulcatis distinguenda.

Frutex 1·5–2-metralis, novellis purpureo-brunneis glabris. *Folia* ovata, ovato-oblonga vel late rhomboidea, acuta vel acuminata, basi saepissime late cuneata nonnunquam rotundata, margine nisi triente basali grosse dentata, 4–13 cm. longa, 2·5–8 cm. lata, nervis primariis 4–6-jugis ad dentium apices terminantibus, supra saturate viridia primum secus costam nervosque stellato-pubescentia, infra pallidiora primum in venarum angulis et secus costam nervosque floccose stellato-pubescentia, adulta utrinque glabrescentia vel glabra; petioli 0·8–2·5 cm. longa, primum pubescentes demum glabri; stipulae subulatae, deciduae, 3 mm. longae. *Corymbi* terminales, 7-radii, 5–11 cm. lati; pedunculi 0·6–2·5 cm. longi, glabri vel parce pubescentes, ter quaterve furcatim ramosi. *Flores* albi, congesti, 5 mm. lati; pedicelli glandulosi, 3 mm. longi. *Calyx* minutus; lobi 5, parce ciliati. *Corolla* 5-loba; lobi orbiculares. *Stamina* 5, petalis longiora; antherae luteae. *Ovarium* glandulosum; stylus calycis lobos duplo excedens. *Fructus* ruber, drupaceus, globosus, 6 mm. latus; pyrena compressa, subrotunda.—*V. Willeanum*, Graebner in Engl. Bot. Jahrb. vol. xxix. p. 589 (1901).—W. J. BEAN.

The plant of *Viburnum betulifolium* from which our material for figuring was obtained was raised from seed collected by Mr. E. H. Wilson, near Ichang, in November, 1907. The seed was presented to Kew the following spring by the Arnold Arboretum. The plants then raised have grown vigorously, and are now three to four feet high. This species is the most ornamental of all the new deciduous ones from Central and Western China, so far as their qualities have up to the present been displayed at Kew. It has no particular merit in regard to its blossom, but about the middle of October, when laden with its heavy clusters of bright red fruits, it is one of the most attractive of shrubs. Given a good loamy soil and a moist

situation it grows well, and it can be increased quite easily either by seeds or by cuttings. *V. betulifolium* belongs to a group of closely allied red-fruited species from China, and is most nearly related to *V. lobophyllum*, Graebner, nor is it easy to find constant characters to separate the two plants. The best probably is the shape of the nut, which in *V. betulifolium* is smaller and nearly circular in outline, in *V. lobophyllum* ovate, tapering to a point at one end and more deeply grooved. The leaves of *V. lobophyllum*, also, are more uniformly rounded at the base and less deeply toothed. We do not find that the relative lengths of the style and calyx-lobes, the length of the peduncles or the pubescence of the leaves, afford reliable characters.

DESCRIPTION.—*Shrub* of bushy habit, probably 4 to 6 ft. high; young wood purplish-brown, glabrous. *Leaves* ovate and ovate-oblong to broadly rhomboid, acute or acuminate, usually broadly cuneate, sometimes rounded at the base, coarsely dentate in the terminal two-thirds, $1\frac{1}{2}$–$5\frac{1}{4}$ in. long, 1–$3\frac{1}{4}$ in. wide; main veins in 4–6 pairs running out to the tips of the teeth; dark green above and glabrous except for a line of stellate pubescence when young on the midrib and chief veins; pale beneath, with tufts of stellate pubescence in the vein-axils and on the midrib and veins: by the time the fruit is ripe the leaves are nearly or quite glabrous; petioles $\frac{1}{3}$–1 in. long, at first pubescent and furnished near the base with two small subulate stipules $\frac{1}{8}$ in. long. *Corymbs* terminal, 7-rayed, 2–$4\frac{1}{2}$ in. wide; peduncles $\frac{1}{4}$–1 in. long, glabrous or slightly pubescent, subdivided three or four times. *Flowers* white, crowded, $\frac{3}{16}$ in. wide; pedicels glandular, $\frac{1}{8}$ in. long. *Calyx* minute, its five lobes sparingly ciliate. *Corolla* 5-lobed; lobes orbicular. *Stamens* 5, longer than the corolla; *anthers* yellow. *Ovary* glandular; style about twice as long as the calyx-lobes. *Fruit* a red globose drupe, $\frac{1}{4}$ in. wide; stone compressed, roundish.

Fig. 1, flowers; 2, calyx and pistil; 3, stamens:—*all enlarged.*

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M.S del. J.N. Fitch lith.

Vincent Brooks, Day & Son Lt.d imp

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Tab. 8673.

EUPHORBIA Caput-Medusae.

South Africa.

Euphorbiaceae. Tribe Euphorbieae.

Euphorbia, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. iii. p. 258.

Euphorbia Caput-Medusae, *Linn. Sp. Pl.* ed. 1, p. 452, *Amoen. Acad.* vol. iii. p. 110, *et Syst. Nat.* ed. 12, vol. ii. p. 330; *Mill. Gard. Dict.* ed. 8, no. 7; *Ait. Hort. Kew.* ed. 1, vol. ii. p. 135; *Lodd. Bot. Cab.* t. 1315; *Boiss. in DC. Prodr.* vol. xv. pars ii. p. 86; *K. Schum. in Monatsschr. Kakt.* vol. viii. pp. 53, 54; *Berger in Monatsschr. Kakt.* vol. viii. p. 91, *et Sukk. Euphorb.* p. 110, fig. 29; *Marloth in Wissensch. Ergebn. Deutsch Tiefsee-Exped.* vol. ii. pars iii. t. 9; *N. E. Br. in Kew Bull.* 1912, p. 246, cum tab., *et in Dyer, Fl. Cap.* vol. v. pt. ii. p. 239; species habitu insigne et appendicibus involucri conspicuis albis distincta.

Frutex succulenta nana. *Caulis* subglobosus, usque ad 15–20 cm. diametro, apice depresso, ramis numerosissimis rosulatis dense obtectus. *Rami* interiores suberecti, 5–10 cm. longi, exteriores patuli 15–37 cm. longi, 1·7–2·5 (nonnunquam an ex norma ad 4) cm. crassi, cylindrici, tuberculati, glabri, virides, tuberculis 3–5 mm. prominentibus obtusis. *Folia* 3–5 mm. longa, 1 mm. lata, linearia, acuta vel obtusa, crassa, supra plana vel subcanaliculata, subtus valde convexa, glabra. *Pedunculi* 3–10 mm. longi, ex axillis tuberculorum ad apicem ramorum enati, crassi, minute bracteolati, persistentes, virides. *Involucrum* 10–12 mm. diametro, extra glabrum; lobi subquadrati, denticulati, intra pubescentes, extra glabri, fusco-purpurei; glandes virides, appendicibus petaloideis albis in lobos 3–6 palmatim divisis vel transversim oblongis et denticulatis. *Ovarium* subsessile, obtuse trigonum, glabrum; styli 2–5 mm. longi, ad medium vel fere ad apicem connati, erecti.—*E. Fructus-Pini*, Mill. Gard. Dict. ed. 8, no. 10. *E. Medusae*, Thunb. Prodr. vol. ii. p. 86, et Fl. Cap. ed. Schult. p. 404. *E. tessellata*, Sweet, Hort. Suburb. Lond. p. 107. *E. Fructus-Pini* var. *geminata*, Sweet, Hort. Brit. ed. 1, p. 356. *E. Commelini*, DC. Cat. Pl. Hort. Monspel. p. 110; Spreng. Syst. vol. iii. p. 787. *Medusea Fructus-Pini*, *M. major* et *M. tessellata*, Haw. Synop. pp. 134, 135; Klotzsch & Garcke in Abhandl. Akad. Berlin, 1860, p. 61. *Tithymalus aizoides Africanus simplici squamato caule*, Comm. Praelud. Bot. p. 57, fig. 7. *Euphorbium procumbens ramis plurimis, &c.*, et *E. procumbens ramis geminatis, &c.*, Burm. Rar. Afr. Pl. pp. 17, 18, tt. 8, 9. *Euphorbium anacanthum angusto Polygoni folio*, var. 1 et 2 tantum, Isnard in Mém. Acad. Roy. Sci. Paris, 1720, pp. 386, 387.—N. E. Brown.

This *Euphorbia* is a native of South Africa which has been known in European succulent collections for over two centuries. Its early introduction is doubtless due to its occurrence on the mountains near Cape Town, to which it appears to be confined. Although the name *E. Caput-*

Medusae was published by Linnaeus more than a century and a half ago, there was long some doubt as to its precise incidence, owing to the fact that the author cited under his description figures which represent five distinct species. But, as Mr. Brown has elsewhere pointed out, the plant Linnaeus had in view must have been one in the garden of Mr. George Clifford; that plant must have come from near Cape Town; the only species from there which agrees with the description of Linnaeus is that now depicted. The specimen figured was grown in the garden of Lady Hanbury at La Mortola, Ventimiglia, where it flowered in March, 1916; it only differs from the wild plant in having considerably thicker branches. The sketch which accompanies our figure has been reduced from a photograph of a living specimen, eighteen inches across, obtained by Mr. E. Pillans in December, 1911, on the slopes of the Lion's Head near Cape Town. Like the other members of its section, *E. Caput-Medusae* is easily grown in this country under ordinary greenhouse conditions.

DESCRIPTION.—*Shrub*, dwarf, succulent; stem subglobose, sometimes 6–8 in. thick, depressed at the top and giving off many rosulate branches, the central more or less erect, 2–4 in. long, the outer spreading, 6–15 in. long, all as a rule $\frac{2}{3}$–1 in., but sometimes $1\frac{1}{2}$ in., thick, cylindric, tuberculate, glabrous, green; tubercles blunt, $\frac{1}{8}$–$\frac{1}{5}$ in. high. *Leaves* $\frac{1}{8}$–$\frac{1}{5}$ in. long, narrow linear, acute or obtuse, thick, flat or channelled above, very convex beneath, glabrous. *Peduncles* $\frac{1}{8}$–$\frac{1}{3}$ in. long, in the axils of the tubercles near the ends of the branches, thick, minutely bracteoled, persistent, green. *Involucre* $\frac{1}{3}$–$\frac{1}{2}$ in. across, glabrous outside; lobes almost quadrate, denticulate, pubescent within, glabrous outside, tawny-purple; glands green, their appendages petaloid, white, palmately 3–6-lobed or transversely oblong and denticulate. *Ovary* almost sessile, bluntly trigonous, glabrous; styles $\frac{1}{12}$–$\frac{1}{5}$ in. long, connate to or beyond the middle, erect.

Fig. 1, involucre, with bracts on pedicel; 2, the same, from above; 3, portion of an involucre, showing inflexed lobes and intervening gland with appendages; 4, male flowers, with bracteoles; 5, female flower; 6, sketch, from photograph, of an entire plant:—*all enlarged except* 6, *which is much reduced.*

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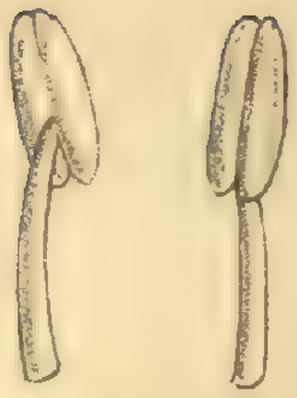

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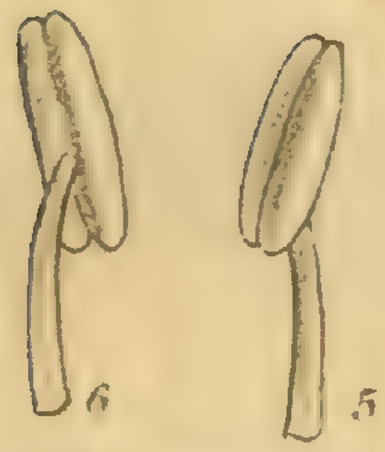

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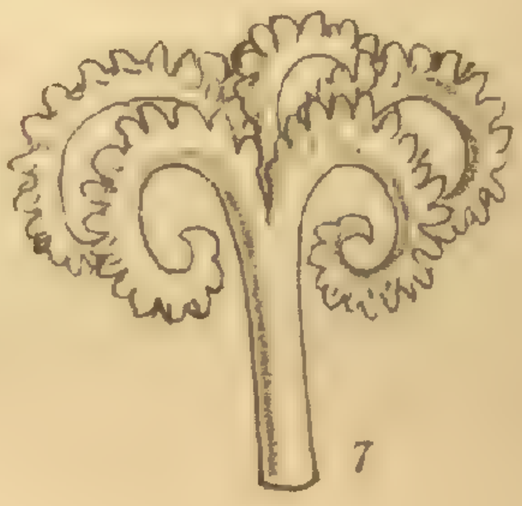

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M.S del. J.N. Fitch lith.

Vincent Brooks, Day & Son Lt.d imp.

L. Reeve & C.o London.

Tab. 8674a.

MESEMBRYANTHEMUM TRANSVAALENSE.

South Africa.

Ficoideae. Tribe Mesembryeae.

Mesembryanthemum, *Linn.*; *Benth. et Hook. f. Gen. Plant.* **vol. i. p. 853.**

Mesembryanthemum (§ Aloidea) **transvaalense**, *Rolfe*; species nova *M. albipunctato*, Haw., affinis, sed foliis patentibus vel subreflexis, floribus majoribus, petalis rubro-lineatis et stylis clavatis differt.

Herba parva, acaulis. *Folia* 8–11, patentia vel subreflexa, lineari-oblonga, subacuta, integra, crassa, nitida, viridia, crebre et minute verruculosa, 2·5–4 cm. longa, 0·5–0·6 cm. lata, 0·4–0·5 cm. crassa, supra planiuscula vel subconcava, subtus convexa, vix carinata, apice incurvula, triquetro-compressa. *Flores* subsessiles, expansi 2·5–3 cm. diametro. *Calyx* late campanulatus; lobi late deltoideo-ovati, acuti, 0·6–0·7 cm. longi, minute verruculosi, margine membranacei. *Petala* numerosissima, patentia vel subreflexa, circiter 1 cm. longa, lutea, medio rubro-lineata. *Stamina* numerosa, erecta; filamenta albida; antherae flavidae. *Styli* 10, erecti, apice patentes, subclavati.—**R. A. Rolfe.**

For the introduction to our succulent collections of the *Mesembryanthemum* here described horticulture is indebted to the officers of the Department of Agriculture of the Transvaal, by whom it was presented to Kew in 1910. It is a native of the Transvaal, where it was originally obtained by Mr. J. Burtt Davy in the Smitz-kraal-Boshof district. In its native habitat it is met with growing on a brown loam; under cultivation at Kew it has thriven well under the conditions suitable for other South African species. It flowered for the first time in June, 1915, and proved then to be a hitherto uncharacterized species. A member of the *Aloidea* section of its genus, *M. transvaalense* calls to mind *M. vittatum*, N. E. Br., and *M. rubro-lineatum*, N. E. Br., two species in which the petals are similarly marked with a central red line. In all other characters, however, it is more nearly allied to *M. albipunctatum*, Haw., a species introduced many years ago from some locality in South Africa which has not been definitely recorded, though it is known that the plant was found not far

from the coast. From *M. albipunctatum*, however, the species now figured is readily distinguished by its more spreading leaves, its larger, differently coloured flowers and its more distinctly clavate styles.

DESCRIPTION.—*Herb*, small and stemless. *Leaves* 8–11, spreading or somewhat reflexed, linear-oblong, subacute, entire, thick, shining green, closely and finely warted, 1–1$\frac{3}{4}$ in. long, $\frac{1}{5}$–$\frac{1}{4}$ in. wide, $\frac{1}{6}$–$\frac{1}{5}$ in. thick, flattish or somewhat concave above, convex, but hardly keeled beneath, slightly incurved at the tip, compressed triangular. *Flowers* nearly sessile, 1–1$\frac{1}{4}$ in. across. *Calyx* wide campanulate; lobes wide deltoid-ovate, acute, about $\frac{1}{4}$ in. long, finely warted, margin membranous. *Petals* very many, spreading or somewhat reflexed, about $\frac{1}{3}$ in. long, yellow, with a red central line. *Stamens* numerous, erect; filaments whitish; anthers yellowish. *Styles* 10, erect, spreading and somewhat clavate at the tip.

Fig. 1, apex of leaf; 2 and 3, stamens; 4, apex of ovary, with styles:—*all enlarged.*

Tab. 8674b.

MESEMBRYANTHEMUM TUBERCULOSUM.

South Africa.

Ficoideae. Tribe Mesembryeae.

Mesembryanthemum, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. i. p. 853.

Mesembryanthemum (§ Ringentia) **tuberculosum**, *Rolfe*; species nova a *M. tigrino*, Haw., foliorum facie supero tuberculis obtusis albidulis instructo marginibus sparse spinosis et stylis basi connatis apice valde recurvis differt.

Herba parva, acaulis. *Folia* 6–8, subpatentia, deltoideo-ovata, subobtusa, viridia, 2–2·5 cm. longa, 1·5–2 cm. lata, 1 cm. crassa, supra subconvexa, tuberculis obtusis albidulis instructa, subtus convexa, minute albido-punctata, apice triquetro-compressa. *Flores* subsessiles, expansi circiter 4 cm. diametro. *Calyx* campanulatus; lobi oblongi, 1 cm. longi. *Petala* numerosissima, patentia, lutea, 1·3–1·5 cm. longa. *Styli* 5, basi connati, apice valde recurvi, papillosi.—R. A. Rolfe.

The attractive *Mesembryanthemum* figured on the lower portion of our plate is one for whose introduction horticulture is indebted to Mr. N. S. Pillans of Cape Town, by whom it was communicated some ten years ago, along with several other species, to Mr. G. Elisha, Canonbury Park Road North, London. The example of the species now described, which was labelled as being from Namaqualand, arrived in a condition which rendered cultivation impossible. Two seed capsules, however, were still attached to the plant; these were removed and kept until the following spring, when the seeds were separated and sown in a small pan half filled with soil and lightly covered with a layer of fine earth and sand. The pan, covered with a sheet of glass, was placed in a sunny spot in a greenhouse, and by the end of the summer five small but vigorous plants were raised. The appearance of the plants called to mind *M. tigrinum*, Haw., but from the outset it was realised that they could hardly be that species, the leaves being of a much darker green. The appearance on the later-formed leaves of the small raised points, which became more pronounced during the following season, made it certain that this Namaqua

plant was not *M. tigrinum*, but no suggestion as to its identity could be offered. With a view to its ultimate determination one of the five plants was presented to the Kew collection, where it has thriven well under the conditions suitable for other members of the genus. This plant flowered for the first time in October, 1913, and forms the subject of our illustration. It proves to be a hitherto undescribed member of the *Ringentia* section, nearest, as was originally surmised, to *M. tigrinum*. The leaves, however, besides being of a darker green, are less strongly marginally toothed, while the upper surface, instead of being smooth, is tuberculate, each tubercle having a white central spot. The flowers in *M. tuberculosum* are larger, and the styles are united below in a column, their upper free portion being strongly recurved, whereas in *M. tigrinum* the styles are free and nearly erect throughout.

DESCRIPTION.—*Herb*, small and stemless. *Leaves* 6–8, somewhat spreading, deltoid-ovate, rather blunt, green, $\frac{3}{4}$–1 in. long, $\frac{2}{3}$–$\frac{3}{4}$ in. wide, over $\frac{1}{3}$ in. thick, somewhat convex above and beset with blunt, whitish tubercles, convex beneath and finely white-punctate, tip compressed-triangular. *Flowers* nearly sessile, $1\frac{1}{2}$ in. across. *Calyx* campanulate; lobes oblong, over $\frac{1}{3}$ in. long. *Petals* very many, spreading, yellow, $\frac{1}{2}$–$\frac{2}{3}$ in. long. *Styles* 5, connate at the base, much recurved above, papillose.

Figs. 5 and 6, anthers; 7, style and stigma:—*all enlarged.*

M.S. del. J.N. Fitch lith.

Vincent Brooks, Day & Son Lt.d imp.

Tab. 8675.

RHODODENDRON MONOSEMATUM.

Western China.

Ericaceae. Tribe Rhodoreae.

Rhododendron, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. ii. p. 599.

Rhododendron monosematum, *Hutchinson*; species nova affinis *R. pachytricho*, Franch., sed ramulis et petiolis pilis rigidis apice glandulosis setosis, foliorum costa infra glabra, calyce extra glanduloso-piloso differt.

Frutex; ramuli hornotini purpurascentes, basin versus glabrescentes, superne dense foliati et pilis longis glandulosis nigrescentibus dense induti. *Folia* oblonga, basi inaequaliter rotundata, apice abrupte et subacute acuminata, 8–11 cm. longa, 2–3·5 cm. lata, acumine circiter 0·5 cm. longo, rigide coriacea, supra viridia et sicco arcte impresse reticulata, infra pallidiora, subtiliter reticulata, utrinque glabra; nervi laterales utrinsecus circiter 15, utrinque prominuli, intra marginem conjuncti et valde ramosi; petioli 1·5 cm. longi, basin versus hispidi. *Inflorescentia* terminalis, circiter 12-flora; bracteae extra sericeae; pedicelli 1·5–2 cm. longi, pilis apice nigro-glandulosis dense pubescentes. *Calyx* brevis, obscure 5-lobus, extra glanduloso-pubescens, lobis ovato-triangularibus subobtusis glandulosis. *Corolla* late infundibuliformis, albo-rosea, intra basin dorso maculo circiter 6 mm. lato purpureo instructa, extra erubescens; tubus 3 cm. longus, apice circiter 2 cm. diametro, glaber; lobi 5, patulo-recurvati, late ovato-rotundati emarginati, 1·5–2 cm. lati. *Stamina* 10, inclusa; filamenta basin versus pubescentia, 2–2·5 cm. longa; antherae parvae, atro-purpureae, 2·25 mm. longae. *Ovarium* 6-loculare, pilis apice purpureo-glandulosis longe stipitatis dense indutum; stylus glaber, exsertus, flavus, circiter 3 cm. longus.—J. Hutchinson.

The *Rhododendron* here described is closely related to *R. pachytrichum*, Franch., also from Western China, already in cultivation in this country. The most striking difference between the two is in the branchlets and the leaf-stalks. In *R. pachytrichum* the hairs on these and on the midribs are short and copiously branched, and thus impart a mossy appearance; the calyx is moreover quite glabrous. In *R. monosematum* the hairs on the twigs and petioles are long and bristly, simple and gland-tipped; the midrib is glabrous or has but a few gland-tipped hairs, while the calyx is densely glandular-pubescent. The only locality in which the species here figured appears to have been met with in the wild state is Mt. Wu, in Szechuan. Here it was collected in July,

1903, by Mr. E. H. Wilson, as a shrub from six to twenty feet in height, with white or pink flowers. It was raised by Messrs. J. Veitch and Sons at Coombe Wood, from seed collected by Wilson, and the plant figured was purchased for Kew from their establishment in 1913. So far as winter cold is concerned, *R. monosematum* is quite hardy at Kew, but, as with *R. pachytrichum*, its flowers, and even its young shoots, are liable to be injured by late spring frosts following mild weather in January and February. For this reason it is best planted in a position sheltered from the north and east.

DESCRIPTION. — *Shrub*; young shoots tinged with purple, glabrous near the base, upwards densely leafy and closely covered with long stiff dark-coloured glandular hairs. *Leaves* oblong, abruptly and rather acutely acuminate, unequally rounded at the base, 3–4¼ in. long, ¾–1½ in. wide, the tip about ⅕ in. long, firmly leathery, green above and when dry closely reticulate, paler and very finely reticulate beneath, glabrous on both surfaces; lateral nerves about 15 on each side the midrib, somewhat raised on both surfaces, anastomosing and much branched within the margin; petiole ⅔ in. long, hispid especially near the base. *Inflorescence* terminal, about 12-flowered; bracts silky outside; pedicels ⅔–¾ in. long, densely clothed with dark glandular hairs. *Calyx* short, obscurely 5-lobed, glandular-pubescent outside; lobes ovate-triangular, rather obtuse, glandular. *Corolla* wide funnel-shaped, white suffused with rose-pink, outside reddish, inside with a purple basal blotch about ¼ in. across; tube 1¼ in. long, about ¾ in. wide, glabrous; lobes 5, spreading or recurved, wide ovate-rotund, emarginate, ⅔–¾ in. across. *Stamens* 10, included; filaments pubescent towards the base, ¾–1 in. long; anthers small, dark-purple, about 1/10 in. long. *Ovary* 6-celled, densely clothed with long hairs tipped with purple glands; style glabrous, exserted, yellow, about 1¼ in. long.

Fig. 1, base of leaf with apex of petiole; 2, apex of leaf; 3, bract; 4, calyx and pistil; 5, glandular hairs from the ovary; 6, corolla, laid open; 7 and 8, stamens; 9, transverse section of ovary:—*all enlarged*

M.S del. J.N.Fitch lith.

Vincent Brooks, Day & Son Lith.

L.Reeve & Co London

Tab. 8676.

URSINIA cakilefolia.

South-West Africa.

Compositae. Tribe Arctotideae.

Ursinia, *Gaertn.*; *Benth. et Hook. f. Gen. Plant.* vol. ii. p. 456.

Ursinia cakilefolia, *DC. Prodr.* vol. v. p. 690; *Harv. in Harv. et Sond. Fl. Cap.* vol. iii. p. 152; species *U. namaquensi*, Schlechter, affinis, sed involucri bracteis exterioribus acute acuminatis differt.

Herba circiter 3 dm. alta, basi parce ramosa; caulis et rami virides, longitudinaliter sulcati, glabri, laxe foliati. *Folia* bipinnatisecta, 3–5·5 cm. longa, glauco-viridia, glabra, segmentis linearibus acutissime et minute mucronatis; petioli basi complanati, plerumque lobulis lateralibus acutis muniti. *Capitula* solitaria, longissime pedunculata, circiter 7 cm. expansa; pedunculi terminales, usque ad 20 cm. longi. *Involucrum* late et breviter campanulatum, 1 cm. longum, 1·5–2 cm. diametro; bracteae circiter 6-seriatae, ab extremo sensim longiores, exteriores acute acuminatae, demum patulo-recurvatae, intermediae et interiores obtuse membranaceo-appendiculatae, glabrae. *Flores radii* 20–25, subbiseriatae, patuli, supra aurantiaci, infra paullo pallidiores; corollae tubus 0; limbus oblongo-oblanceolatus, apice integer, 2·5–3 cm. longus, 6–7 mm. latus, circiter 6-nervus; achaenia abortiva, linearia, apicem versus lateraliter parce pilosa. *Flores disci* nigro-purpurei; corollae tubus inferne cylindricus, superne anguste campanulato-ampliatus, glaber; lobi 5, triangulares. *Pappi squamae* late ovatae vel suborbiculares, membranaceae, 1·5 mm. longae, glabrae. *Achaenia* anguste obovoidea, glabra. *Receptaculi squamae* flores disci involventes, apice interdum subdenticulatae, membranaceae, glabrae. —J. Hutchinson.

The genus *Ursinia*, Gaertn., with which is now incorporated *Sphenogyne*, R. Br., includes between sixty and seventy species, all of them African and almost all confined to extra-tropical South Africa. Many of the forms are closely allied to each other and difficult to distinguish unless examined in a living state. A few of them are already grown in Europe as half-hardy annuals, and *U. cakilefolia*, now figured, introduced to Kew in 1914 by means of seed received from Professor Pearson, Director of the National Botanic Garden, Kirstenbosch, Cape Town, promises to be a useful addition to the number. This species was first collected by Drège, on the Giftberg, in South-West Africa, and appears to have been met with again by Mr. N. S. Pillans, from whose garden came the seeds whence the Kirstenbosch plants

were raised. Its nearest ally is a species distributed by Dr. Schlechter, under the manuscript name *U. namaquensis*, which differs especially from *U. cakilefolia* in having blunt outer involucral bracts. Mr. J. W. Matthews, Cape Town, recommends sowing the seed of *U. cakilefolia* early in March; hardened off for planting out in May, it should commence flowering in June, and continue in flower till cut down by frost. He advises a poor light sandy soil, and a sunny border or bank. At Kew it has flowered in June under glass, and done so freely, later in the summer, in a border. Semi-procumbent in habit, it makes a bushy plant about a foot high and as much through. It seeds freely, and at the Cape the percentage of fertility is high.

DESCRIPTION. — *Herb* about 1 ft. high, sparingly branched at the base; stem and branches green, sulcate, glabrous. *Leaves* lax, 2-pinnatisect, $1\frac{1}{4}$–$2\frac{1}{4}$ in. long, glaucous-green, glabrous; segments linear, finely sharply mucronate; petiole folded at the base, usually with acute lateral lobules. *Heads* solitary, very long stalked, about $2\frac{3}{4}$ in. across; peduncles terminal, reaching 8 in. in length. *Involucre* short, wide-campanulate, about $\frac{1}{3}$ in. deep, $\frac{2}{3}$–$\frac{3}{4}$ in. across; bracts about 6-seriate, gradually longer from without inwards, the outer acutely acuminate, spreading or recurved, the intermediate and inner with blunt membranous appendages, glabrous. *Ray-florets* 20–25, almost 2-seriate, spreading, orange above, rather paler beneath; corolla-tube 0; limb oblong-lanceolate with entire tip, 1–$1\frac{1}{4}$ in. long, over $\frac{1}{4}$ in. wide, about 6-nerved; achenes abortive, linear, sparingly hairy on the sides near the top. *Disk-florets* blackish-purple; corolla tube cylindric below, narrow-campanulate upwards, glabrous; lobes 5, triangular. *Pappus-scales* wide ovate or orbicular, membranous, $\frac{1}{16}$ in. long, glabrous. *Achenes* narrow obovoid, glabrous. *Receptacle-scales* enveloping the disk-florets, sometimes slightly toothed, membranous, glabrous.

Fig. 1, young flower-head; 2 and 3, involucral bracts; 4, base of ray-floret; 5, young disk-floret with receptacle-scale; 6, disk-floret; 7, pappus-scale of disk-floret; 8, anthers; 9, style-arms;—*all enlarged.*

M.S. del. J.N. Fitch lith.

Vincent Brooks, Day & Son Ltd imp

L. Reeve & Cº London.

Tab. 8677.

LONICERA tatarica.

South-Eastern Russia to Siberia.

Caprifoliaceae. Tribe Lonicereae.

Lonicera, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. ii. p. 5.

Lonicera tatarica, *Linn. Sp. Pl.* p. 173; *DC. Prodr.* vol. iv. p. 335; *Ledeb. Fl. Ross.* vol. ii. p. 388; *Koch, Dendr.* vol. ii. p. 26; *Rehder, Syn. Gen. Lonicera in Rep. Miss. Bot. Gard.* vol. xiv. p. 126; *C. K. Schneider, Handb. Laubholzk.* vol. ii. p. 716; species ab omnibus gregis *Tataricarum*, Rehder, labio corollae superiore multo magis diviso et bracteolis liberis vel subliberis distincta.

Frutex ad 3 m. altus, ramis glabris, cortice demum cinerascente. *Folia* ovata vel ovato-oblonga, acuta vel rarius obtusiuscula, basi subtruncato-cordata vel abrupte rotundata, 3–6 cm. longa, 1·5–3 cm. lata, viridia, infra pallidiora, glabra; petiolus 2–6 mm. longus. *Flores* geminati in pedunculis axillaribus glabris 1·5–2·2 cm. longis; bracteae subulatae, glabrae, 2–5 mm. longae; bracteolae late ellipticae, obtusae, liberae vel fere liberae, circiter 1 mm. longae. *Corolla* alba vel magis minusve roseo-suffusa, glabra; tubus basi subgibbosus; lobi laterales a posticis fere ad limbi basin separati. *Antherae* e faucibus corollae exsertae, sed limbo breviores. *Baccae* rubrae, liberae vel subliberae, ad 7 mm. diametro.—*Xylosteum cordatum*, Moench, Meth. p. 502. *X. tataricum*, Dumont de Courset, Bot. Cult. vol. ii. p. 275. *Chamaecerasus tatarica*, Billiard, L'Hort. Fr. p. 256. *Caprifolium tataricum*, O. Kuntze, Rev. Gen. vol. i. p. 274.—O. Stapf.

Lonicera tatarica is one of the best and most reliable for gardens of all the bush Honeysuckles; it is a free grower in all but the poorest soils and flowers abundantly every season. There are many forms in cultivation in gardens, the differences being mainly in the size and colour of the corolla, and Rehder in his synopsis of the genus enumerates, in addition to three more distinct varieties, no fewer than twenty-two separate forms of the typical plant. Of these the one here figured, from material supplied from the garden of Mr. W. Robinson at Gravetye, near East Grinstead, is perhaps the most attractive. It is marked by the full rounded character of the corolla segments and the rich shade of the flowers. Propagation of any of the forms is easily effected by cuttings. This shrub was first made known by Amman in 1739, and described by him as a

Chamaecerasus from specimens collected some years earlier, near Orenburg, by Heinzelmann, mentioning that it had also been found by Gmelin in Dauria. Gmelin's own record is from Transbaicalia, and Pallas speaks of its occurrence in the Selanga basin. There is no later record of this *Lonicera* from these eastern localities, and recent authors omit them from its area. It certainly occurs, however, from the lower Volga to the Altai range, and throughout the greater part of Northern Turkestan. The flowers of the Orenburg form are said by Amman to be white; Linnaeus in 1763 termed them incarnate, but in 1767 alluded to them as white. Pallas, who also described them as incarnate, has remarked that a white variety is to be found in shady woods. An unusually dark-coloured form, now generally referred to *L. tatarica*, was figured in this work at t. 2469 as *L. punicea*, Sims. In that figure, however, the posticous lobes of the limb are shown as free to the base, and the limb is described as five-cleft with the lobes nearly equal, so that, although the other characters suggest *L. tatarica*, this reduction is somewhat doubtful.

DESCRIPTION. — *Shrub*, reaching 10 ft. in height; branches glabrous; old bark greyish. *Leaves* ovate or ovate-oblong, acute or occasionally somewhat obtuse, base rather truncately cordate or rounded, $1\frac{1}{4}$–$2\frac{1}{2}$ in. long, $\frac{2}{3}$–$1\frac{1}{4}$ in. wide, green, paler beneath, glabrous; petiole $\frac{1}{12}$–$\frac{1}{4}$ in. long. *Flowers* in pairs on axillary glabrous peduncles $\frac{2}{3}$–$\frac{4}{5}$ in. long, bracts subulate, glabrous, $\frac{1}{12}$–$\frac{1}{5}$ in. long; bracteoles wide elliptic, obtuse, free or nearly so, very short. *Corolla* white or more or less flushed with rose-pink, glabrous; tube rather gibbous at the base; lateral lobes free from the posterior lobes almost to the base of the limb. *Anthers* distinctly exserted from the corolla throat but shorter than the corolla-limb. *Berries* red, free or nearly so, over $\frac{1}{4}$ in. across.

Fig. 1, a pair of flowers, from which the corolla has been removed; 2, corolla, laid open; 3 and 4, anthers; 5, style and stigma:—*all enlarged*.

M.S. del J.N Fitch lith

Vincent Brooks, Day & Son Lt.d imp.

L. Reeve & C.o London

Tab. 8678.

ACACALLIS cyanea.

Upper Amazon.

Orchidaceae. Tribe Vandeae.

Acacallis, *Lindl.*; *Benth. et Hook. f. Gen. Plant.* vol. iii. p. 544.

Acacallis cyanea, *Lindl. Fol. Orch. Acacal.* p. 1; *Veitch, Man. Orch.* pars ix. p. 70; *Cogn. in Mart. Fl. Bras.* vol. iii. pars v. p. 524; *Rolfe in Orch. Rev.* 1907, p. 40; species unica.

Herba epiphytica. *Rhizoma* lignosum, repens, radicans, vaginis imbricatis vestitum. *Pseudobulbi* parvi, paullo incrassati, monophylli. *Folia* petiolata, obovato-elliptica, acuminata, subplicata, 20–25 cm. longa, 3–8 cm. lata. *Scapi* 15–20 cm. longi, vaginis paucis vestiti; racemi pauci-multiflori; bracteae ovato-oblongae, acutae, 0·8–1 cm. longae; pedicelli 2 cm. longi. *Flores* speciosi, expansi. *Sepala* obovata, subacuta, concava, 2·5 cm. longa. *Petala* orbiculari-obovata, 2·5–3 cm. lata. *Labellum* unguiculatum, erecto-patens; limbus reniformi-obovatus, emarginatus, undulatus, 2·5–2·8 cm. latus, basi concavus; discus basi late cristatus; crista striata, apice fimbriato-dentata. *Columna* brevis, suberecta, 1 cm. longa, basi in pedem brevem producta; alae rotundato-oblongae; pollinia 4, pyriformia; stipes planus, obovato-oblongus; glandula rotundata.—*Aganisia cyanea*, Reichb. f. Beitr. Orch. p. 13, t. 4, et in Nov. Act. Acad. Nat. Cur. vol. xxxv. n. 2, t. 4; Lindenia, vol. iii. t. 110. *A. coerulea*, Reichb. f. in Gard. Chron. 1886, vol. xxv. p. 720; Williams, Orch. Alb. vol. viii. t. 374; Rev. Hort. 1898, p. 432, cum icon. *A. tricolor*, N. E. Br. in Lindenia, vol. i. t. 45. *Kochiophyton negrense*, Schlechter ex Cogn. in Mart. Fl. Bras. vol. iii. pars vi. p. 574, t. 119.—R. A. Rolfe.

This striking Orchid is a native of the upper Amazon region, where it was first met with by the late Dr. R. Spruce, growing on trees near forest streams at Barra on the Rio Negro in July, 1851, and a little later at the Secus cataract, near Panurè, on the Rio Uapès. It was described by Lindley from Spruce's specimens as a new genus nearly related to *Warrea*, Lindl., and to *Huntleya*, Batem., the latter allied if not reducible to *Zygopetalum*, Hook. From both, however, it is readily distinguished both by structure and by habit. The account by Spruce of the beauty of *Acacallis* led to a desire to introduce the plant, the fulfilment of which was not accomplished until, in 1883, an example obtained by Mr. Morris, a collector in the service of Mr. E. Corning, Kenwood, Albany County, New York, came into flower. According

to Morris the rootstock is often twenty feet long, its ramifications conveying the impression of lattice-work. The first plant to flower in England did so in the collection of Mr. Walter Holland, Mossley Hill, Liverpool, in August, 1885. In 1871, Reichenbach, dealing with Spruce's specimens, had reduced *Acacallis* to *Aganisia*, Lindl., and in 1885, on receiving, through Mr. W. Bull, fresh flowers from Mr. Holland's plant, still adhered to this view, but in recounting the history of the species inadvertently substituted the name *coerulea* for *cyanea*. This is not the only mishap which has occurred; the plant has since then been described as *Aganisia tricolor*. That *Acacallis*, with its saccate lip-claw, its different column, and its scandent habit, cannot be an *Aganisia*, has been established by Dr. Schlechter, who, however, in dealing with the genus under the name *Kochiophyton*, overlooked the fact that it had already been characterized by Lindley. The plant figured was presented to Kew while in flower by Mrs. Charles Booth; it was brought from the Amazon by a commander of the Booth Line. It thrives in the tropical Orchid House at Kew, and flowered there in July, 1914.

Description.—*Herb*, epiphytic; rhizome very long, woody, emitting many roots, creeping or climbing, and clothed with imbricate sheaths; pseudobulbs small, slightly thickened, 1-foliate. *Leaves* petioled, obovate-elliptic, acuminate, somewhat plicate, 8–10 in. long, $1\frac{1}{4}$–3 in. wide. *Scapes* 6–8 in. long, with few sheaths, racemes few- to many-flowered; bracts ovate-oblong, acute, $\frac{1}{3}$–$\frac{2}{5}$ in. long; pedicels $\frac{3}{4}$ in. long. *Flowers* showy, wide explanate. *Sepals* obovate, rather acute, concave, 1 in. long. *Petals* orbicular-ovate, 1–$1\frac{1}{4}$ in. wide. *Lip* stalked, erect then spreading; limb reniform-obovate, emarginate, undulate, 1–$1\frac{1}{8}$ in. wide, concave at base; disk wide-crested at base; crest striate, fimbriate-toothed. *Column* short, almost erect, $\frac{2}{5}$ in. long, produced below in a short foot; wings rounded-oblong; pollinia 4, pyriform; stipes flat, obovate-oblong; gland rounded.

Fig. 1, base of the lip; 2, column; 3, anther-cap; 4, pollinarium, seen from behind and in front:—*all enlarged*.

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BOTANICAL MAGAZINE.

CONTENTS OF Nos. 142, 143, 144, OCTOBER, NOVEMBER, DECEMBER, 1916.

No. 142, October, 1916.

Tab. 8679.—ROSA DAVIDII.
„ 8680.—THURANTHOS MACRANTHUM.
„ 8681.—STAPELIA GETTLEFII.
„ 8682.—CALLICARPA GIRALDIANA.
„ 8683.—DENDROBIUM PALPEBRAE.

No. 143, November, 1916.

Tab. 8684.—TELOPEA OREADES.
„ 8685.—CYTISUS MONSPESSULANUS.
„ 8686.—CLEMATIS AFOLIATA.
„ 8687.—ARTANEMA LONGIFOLIUM.

No. 144, December, 1916.

Tab. 8688.—ROSA CERASOCARPA.
„ 8689.—HUNTLEYA CITRINA.
„ 8690.—SANGUISORBA OBTUSA, var. AMOENA.
„ 8691.—ABIES CEPHALONICA.

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Tab. 8679.

ROSA Davidii.

China.

Rosaceae. Tribe Roseae.

Rosa, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. i. p. 625.

Rosa Davidii, *Crép. in Bull. Soc. Bot. Belg.* vol. xiii. p. 253 (1874); *Franch in Nouv. Arch. Mus. Paris*, sér. 2, vol. v. p. 270 (*Pl. David.* vol. i. p. 118) *Rehder & Wils. in Sarg. Pl. Wilson.* vol. ii. p. 332; affinis *R. corymbulosae*, Rolfe, sed foliolis plurimis simpliciter serratis, corymbis laxis, bracteis majoribus, floribus majoribus et glandulis longioribus differt.

Frutex erectus, parce ramosus, 1–2-metralis; ramuli laeves, aculeis rectis patentibus sublatis dispersis 4–6 mm. longis armati, demum brunnei. *Folia* 8–10 cm. longa, 7–9-foliolata; rhachis puberula, aculeis gracilibus sparsis instructa; foliola subsessilia, elliptico-oblonga vel ovato-oblonga, subacuta, simpliciter et acute serrata, subtus cinereo-puberula, 2–3 cm. longa, 1–1·5 cm. lata; stipulae adnatae, anguste oblongae, acutae vel acuminatae, integrae, 0·7–1·5 cm. longae. *Flores* rosei, corymbulosi, versus apices ramorum laxe dispositi, circiter 3 cm. diametro. *Bracteae* ovatae, acuminatae, puberulae, 1·2–1·5 cm. longae. *Pedunculi* graciles, 3–4 cm. longi, glanduloso-setulosi. *Receptaculum* anguste ovoideo-oblongum, 3–4 mm. longum, crebre glandulosum. *Calycis* lobi basi ovati, apice longe foliacei et lanceolati, acuti, 1·3–2 cm. longi, patentes, intus cinereo-tomentosi. *Petala* late obcordata. *Filamenta* glabra, 4–5 mm. longa; antheris aureis. *Styli* villosi, in columnam 6 mm. longam cohaerentes. *Fructus* ovoideus, 1–1·3 cm. longus, coccineus, sepalis persistentibus suberectis coronatus. *Achaenia* villosa, ovoidea, 3 mm. longa.—R. A. Rolfe.

The Rose here figured was originally described by Crépin in 1874, and was based on a flowering specimen forwarded by Decaisne which was then believed to have been received through the Abbé David from Mongolia. It was placed somewhat doubtfully in the section *Synstylae*, and was compared with *R. moschata*, Herrm., though the difference in colour of petals and in the shape of the sepals and bracts was pointed out. This comparison and the reference to *Synstylae* have tended to obscure the identity of David's plant, but a photograph of the original specimen supplied by Mr. Gagnepain shows that on the original label Crépin added to the name the remark "R. macrophylla, var.," a suggestion more in accord with its true affinity. This photograph further shows that David had himself given the locality as

Eastern Tibet, and Mr. E. H. Wilson, who has also collected this species, remarks that it is common on the mountains of Moupine in Western Szechuan. The bush from which our plate has been prepared was raised from seed sent from the Arnold Arboretum in 1909. At Kew it has grown very freely and borne good crops of its graceful fruit. The seed in question was obtained by Wilson in September, 1908, near Wen-ch'uan Hsien in Western Szechuan at 7,000–10,000 feet above sea-level. In the wild state it occurs in thickets and forms a bush three to five feet in height. At Kew it has proved one of the most easily grown species of Rose, and thrives excellently in stiff loamy soil. In addition to the highly coloured fruits a marked feature of this *Rosa* is afforded by the numerous ovate bracts which sometimes exceed in size those shown in our figure. Like other members of its group, *R. Davidii* should be easily increased by cuttings taken in August and placed in a propagating case in gentle heat.

DESCRIPTION.—*Shrub*, sparingly branched, 3–5 ft. high; twigs smooth, armed with straight, spreading, subulate, scattered prickles $\frac{1}{8}$–$\frac{1}{6}$ in. long, bark at length brown. *Leaves* 3–4 in. long, 7–9 foliolate; rachis puberulous, with scattered slender prickles; leaflets subsessile, elliptic-oblong or ovate-oblong, subacute, simply sharply serrate, grey puberulous beneath, $\frac{3}{4}$–$1\frac{1}{4}$ in. long, $\frac{1}{3}$–$\frac{2}{3}$ in. wide; stipules adnate, narrow-oblong, acute or acuminate, entire, $\frac{1}{4}$–$\frac{2}{3}$ in. long. *Flowers* rose-pink, somewhat loosely corymbose, near the tips of twigs, about $1\frac{1}{4}$ in. across; bracts ovate, acuminate, puberulous, $\frac{1}{2}$–$\frac{2}{3}$ in. long; peduncles slender, $1\frac{1}{4}$–$1\frac{1}{2}$ in long, slender, setose. *Receptacle* narrowly ovoid-oblong, $1\frac{1}{4}$–$1\frac{1}{2}$ in. long, closely glandular. *Calyx-lobes* leafy, lanceolate from an ovate base, acute, $\frac{1}{2}$–$\frac{3}{4}$ in. long, spreading, grey-tomentose within. *Petals* wide-obcordate. *Filaments* glabrous, $\frac{1}{6}$–$\frac{1}{5}$ in. long; anthers golden-yellow. *Styles* villous, cohering in a column $\frac{1}{4}$ in. long. *Fruit* ovoid, $\frac{1}{3}$–$\frac{1}{2}$ in. long, pink, crowned by the persistent suberect sepals. *Achenes* villous, ovoid, $\frac{1}{8}$ in. long.

Fig. 1, a flower in vertical section, the petals removed; 2 and 3, anthers; 4, carpel with style; 5, achene:—*all enlarged*.

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Tab. 8680.

THURANTHOS macranthum.

South Africa.

Liliaceae. Tribe Scilleae.

Thuranthos, *C. H. Wright in Kew Bulletin*, 1916, p. 233.

Thuranthos macranthum, *C. H. Wright*: **species unica.**

Herba perennis. *Bulbus* 12 cm. diametro, squamis crassis carnosis instructus. *Folia* hysterantha, linearia, acuminata, carinata, glabra, 70 cm. longa, fere 2 cm. lata. *Scapus* 1–1·8 m. altus, cylindricus, basi purpurascens; bracteae deltoideae, acuminatae, 2 mm. longae; pedicelli 4 cm. longi, sub anthesin decurvati, floribus pendulis. *Perianthii* segmenta libera, aequalia, recurvata, oblonga, obtusa, luteo-brunnea, costa lata viridi uninervia instructa, 2·5 cm. longa, 5 mm. lata. *Filamentorum* pars inferior 12 mm. longa, compressa, valide incurvata, luteo-brunnea; pars superior 5 mm. longa, cylindrica, erecta, albescens; antherae dorsifixae, oblongae, 3 mm. longae. *Ovarium* oblongum, trilobatum; stylus columnaris, staminibus paullo longior; stigma discoideum; ovula pluria. *Capsula* oblonga, laevis, 3·5 cm. longa, 1 cm. diametro, pedicillis suberectis instructa.—*Drimia? macrantha*, Baker in Engl. Bot. Jahrb. vol. xv. Heft. 3, p. 7, et in Dyer, Fl. Cap. vol. vi. p. 442. *Ornithogalum? macranthum*, Baker in Journ. Linn. Soc. vol. xiii. p. 280.—C. H. Wright.

The South African Squill which forms the subject of our illustration was first met with by Drège in 1840 in the Uitenhage and Queenstown divisions of Cape Colony, and when originally described was referred doubtfully to the genus *Ornithogalum*. It was subsequently met with in the eastern coast districts of the Colony and in Griqualand East, and on account of its scaly bulb was transferred from *Ornithogalum* to *Drimia*, in which genus, however, its position, owing to there being in our species no campanulate tube, was equally doubtful. More recently it has been met with near Umtata in Tembuland by Canon G. E. Mason and Miss M. H. Mason, and was introduced by them to the Cambridge Botanic Garden, where a plant flowered in May, 1913, afterwards producing leaves which became fully developed in July. From material communicated by Mr. R. I. Lynch, the figure here given of the flowers and leaves has been prepared. The sketch of the bulb and base of the scape has been reduced from an original field-drawing by Miss Mason. The opportunity of examining living

specimens has shown that the plant is more nearly allied to *Albuca* than to *Drimia* or to *Ornithogalum*, but it differs in having the inner perianth-segments erect and shorter than the outer, and differs further so greatly in the structure of the filaments that it seems desirable to accord it the position of a distinct genus, *Thuranthos*, a name based on the disposition of the lower portions of the filaments, which are coloured like the perianth, are outcurved for about a quadrant and connivent above, thus leaving interspaces like the longitudinal openings of a lantern. The portions of the filaments surmounting this lantern are cylindric, white, and erect round the columnar style. The colour of the perianth-segments appears to vary considerably; in field-notes it is given 'red-brown,' 'yellow-green,' 'brown with a red band.' The treatment most suitable for South African species of *Ornithogalum* appears to be equally appropriate to *Thuranthos macranthum* which, Mr. Lynch informs us, though it has thriven satisfactorily at Cambridge, sending up fresh young leaves, has not flowered since it did so in 1913.

DESCRIPTION.—*Herb*, perennial; bulb $4\frac{1}{2}$ in. across, clothed with thick fleshy scales. *Leaves* appearing after flowering, linear, acuminate, keeled, glabrous, over 2 ft. long, about $\frac{3}{4}$ in. wide. *Scape* $3\frac{1}{2}$–6 ft. high, cylindric, purplish near the base; bracts deltoid, acuminate, $\frac{1}{1\frac{1}{2}}$ in. long; pedicels $1\frac{3}{4}$ in. long, decurved; flowers pendulous. *Perianth-segments* free, equal, recurved, oblong, obtuse, brownish-yellow with a longitudinal central green band, 1 in. long, $\frac{1}{5}$ in. wide. *Stamens* equal; lower portion of the filaments $\frac{1}{2}$ in. long, flattened, much incurved, brownish-yellow; upper portion $\frac{1}{5}$ in. long, cylindric, erect, whitish; anthers oblong, dorsifixed, $\frac{1}{8}$ in. long. Ovary oblong, 3-lobed; style columnar, rather larger than the stamens; stigma discoid; ovules several. *Capsule* oblong, smooth, $1\frac{1}{2}$ in. long, over $\frac{1}{3}$ in. wide, borne on erect fruiting pedicels.

Fig. 1, stamen with base of a perianth-segment; 2, pistil; 3, sketch of a bulb and scape-base:—*all enlarged except* 3, *which is much reduced from an original drawing by Miss Mason.*

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Tab. 8681.

STAPELIA Gettleffii.

Transvaal.

Asclepiadaceae. Tribe Stapelieae.

Stapelia, *R. Br.*; *Benth. et Hook. f. Gen. Plant.* vol. ii. p. 784.

Stapelia Gettleffii, *Pott in Ann. Transvaal Mus.* vol. iii. p. 226; affinis *S. hirsutae*, Linn., sed caulibus crassioribus, foliis duplo longioribus appressioribus et corolla fere ad apicem luteo-lineata bene distinguenda.

Herba succulenta 10–20 cm. alta. *Caules* 1·2–1·5 cm. crassi, erecti basi decumbentes, tetragoni angulis compressis dentatis, velutino-pubescentes, virides. *Folia* rudimentaria 9–12 mm. longa, adpresso-erecta, linearilanceolata, acuta. *Cymae* prope basin caulorum enatae, subsessiles, 1–3-florae. *Pedicelli* 6–8 cm. longi, 4–5 mm. crassi, velutini. *Sepala* 10–12 mm. longa, lanceolata, acuta, velutina. *Corolla* 14–16 cm. diametro, profunde 5-loba, extra velutina, flavo-viridis, intus transverse rugosa, disco purpureo longe et molliter purpureo-lanato, lobis fere ad apicem transverse luteo- et purpureo-lineatis marginibus late purpureis et longe purpureo-ciliatis; lobi patentes vel reflexi, 6–7 cm. longi, 2·5 cm. lati, lanceolati, acuti, marginibus revolutis. *Coronae exterioris* lobi 6 mm. longi, erecto-patuli apice recurvi, lanceolati, supra canaliculati, apice subulato-acuminati, atropurpurei; *interioris* lobi 10–12 mm. longi, patuli, subulati, dorso late alati, alis 1–3-dentatis, atropurpurei.—N. E. Brown.

The handsome *Stapelia* here figured was originally discovered in 1911 by Mr. G. F. Gettleffi at Louis Trichardt in the Zoutpansberg division of the Transvaal, and in the same year was found also at Palapye Road. A living plant from the latter locality, sent by Mr. N. S. Pillans, reached Kew in June, 1911. It has thriven well on the sunny shelf of a warm greenhouse and, flowering for the first time in June, 1915, has enabled the accompanying plate to be prepared. A second living plant was sent to Mr. N. E. Brown by Mr. Pillans from Palapye Road in 1911, and another from the Louis Trichardt locality, sent by Mrs. Pott, reached England in 1912. In April, 1913, Mrs. Pott supplied the Kew Herbarium with an excellent dried specimen prepared by her from the plant on which her original description was based. The peculiar fashion in which the unusually large rudimentary leaves are disposed, in an erect position close

to the angles of the stem, at once distinguish it from all the allied species even when it is out of flower. Its nearest ally is *S. hirsuta*, Linn., from the south-western portion of Cape Colony, and one of the most interesting features connected with the plant now described is that its habitat should be separated from that of the older species by a distance of six hundred miles. Like other members of the genus, *S. Gettleffii* requires a well-drained soil, and very little water should be supplied during the winter months.

DESCRIPTION.—*Herb*, succulent, 4–8 in. high; stems $\frac{1}{2}$–$\frac{2}{3}$ in. thick, decumbent below then erect, 4-angled with angles compressed and toothed, velvety-pubescent, green. *Leaves* rudimentary, adpressed-erect, $\frac{1}{3}$–$\frac{1}{2}$ in. long, linear-lanceolate, acute. *Cymes* subsessile, produced near the base of the stem, 1–3-flowered; pedicels $\frac{1}{4}$–$\frac{1}{3}$ in. long, $\frac{1}{6}$–$\frac{1}{5}$ in. thick, velvety. *Sepals* $\frac{1}{3}$–$\frac{1}{2}$ in. long, lanceolate, acute, velvety. *Corolla* about 6 in. across, deeply 5-lobed, velvety outside, yellowish-green, transversely rugose within, the purple disk clothed with long soft pubescence, the lobes with broad purple edges and elsewhere barred with transverse yellow and purple lines; lobes spreading or reflexed, $2\frac{1}{4}$–$2\frac{3}{4}$ in. long, 1 in. across, lanceolate, acute, with margins reflexed. *Corona* double; lobes of the outer corona $\frac{1}{4}$ in. long, somewhat spreading, lanceolate, with a subulate-acuminate recurved dark-purple tip; those of the inner corona $\frac{1}{3}$–$\frac{1}{2}$ in. long, spreading, dark-purple, subulate with a 1–3-toothed broad dorsal wing.

Fig. 1, portion of stem with rudimentary leaves; 2, corona; 3, pollen-masses; 4, sketch of an entire plant:—*all enlarged except* 4, *which is much reduced.*

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Tab. 8682.

CALLICARPA Giraldiana.

China.

Verbenaceae. Tribe Viticeae.

Callicarpa, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. ii. p. 1150.

Callicarpa Giraldiana, *Hesse in Mitt. Deutsch. Dendr. Ges.* vol. xxi. p. 366, cum figuris pp. 368, 369 sed sine descr.; *Rehder in Bailey, Stand. Cycl. Hort.* vol. ii. p. 629 et in *Plant. Wilson.* vol. iii. pars 2, p. 366, pro parte; inter species gregis *C. purpureae*, Juss., tomento ampliore in novellis fulvo-griseo-furfuraceo, floribus majusculis, calycibus laxe stellato-pilosulis, fructibus lilacinis insignis.

Frutex ad 2 m. altus; rami novelli tomento fulvo-griseo-furfuraceo densiusculo obtecti, mox glabrescentes, cortice demum plumbeo laevi vel hicinde ob pilorum bases persistentes rudi. *Folia* late lanceolata vel elliptico-lanceolata, acuta vel acuminata, rarius nonnulla obtusa et tunc interdum obovata, basi acuta, crebre denticulata, dentibus ultra 30 in utroque latere, 8–12 cm. longa, 2·5–5·5 cm. lata, novella tomento fulvo-griseo-furfuraceo e pilis stellatis composito obtecta, mox glabrescentia, matura supra subglabra vel glabra, subtus imprimis in costa nervisque pilis paucis conspersa et minute flavo-glandulosa, nervis lateralibus utrinque 6–10; petiolus circiter 1 cm. longus. *Paniculae* contractae, subglobosae, 2–3·5 cm. diametro, omnibus partibus pilis stellatis indutis, indumento sursum multo laxiore, pedunculo 1–1·5 cm. longo pedicellis 1·5–2·5 mm. longis; bracteae pedicellos magis minusve aequantes. *Calyx* obovato-oblongus, 2–2·5 mm. longus, 4-lobus, lobis subacutis vel obtusis, pilis albis stellatis laxe conspersus. *Corolla* 3·5–4 mm. longa, tubi parte basali cylindrica vix 1 mm. longa, ampliata fere duplo longiore, limbo lilacino, lobis rotundatis brevibus. *Antherae* 1–1·5 mm. longae, plane exsertae longe dehiscentes. *Fructus* circiter 4 mm. diametro, lilacinus.—*C. longifolia*, Diels in Engl. Bot. Jahrb. vol. xxix. p. 548 in parte, non Lam.—O. Stapf.

Callicarpa Giraldiana was raised from seeds presented to Kew in 1908 by the Director of the Arnold Arboretum. They grew very well in the nursery in ordinary soil to a height of 5 to 6 feet, producing in 1914 for the first time a fine crop of fruits, which for several weeks in October and November made a most effective display. In our experience at Kew this is by far the most attractive of its genus as cultivated in the open air. It appears to be perfectly hardy and is of the easiest cultivation. It likes a good loamy soil and its propagation is readily secured either by cuttings or by seeds. It promises

to be one of the most beautiful fruit-bearing shrubs of recent introduction. The species was originally discovered by Mr. A. Henry in Hupeh in 1887, and was met with again by Père Giraldi in Shensi in 1897, but was first recognised as distinct in 1912 when Mr. H. A. Hesse of Weener, East Friesland, who had received seeds from Giraldi through Mr. L. Beissner of Poppelsdorf, published photographic reproductions of a flowering and a fruiting branch, with a note in which the plant was named after the Italian missionary to whom we owe so much of our knowledge of the vegetation of Shensi. Two years later Mr. A. Rehder published a brief diagnosis in Professor Bailey's Cyclopaedia, and the same author has since then, on 31st August, 1916, given a full account of the species in the Plantae Wilsonianae, after having himself seen the shrub in Mr. Hesse's nursery and compared specimens taken therefrom with material collected by Henry, Giraldi and Wilson, including the field-material issued by Mr. Wilson as his n. 439, which corresponds with seeds from which the Kew plant now figured was raised. Dr. Stapf finds, however, that some of the specimens enumerated by Rehder under *C. Giraldiana* belong to other species. When the extraneous elements are excluded it is found that the southern limit of *C. Giraldiana*, so far as is at present known, does not overpass the Yang-tse-Kiang basin, and its area extends from Western Szechuan through Hupeh to Shensi. In the wild state the inflorescences are frequently more scanty than in the cultivated example now figured.

DESCRIPTION.—*Shrub*, 5–6 ft. high; young twigs rather closely tawny-grey pubescent, soon becoming glabrous; bark ultimately leaden-grey, smooth or in places rough with persistent hair-bases. *Leaves* wide-lanceolate, or elliptic-lanceolate, acute or acuminate, rarely some of them blunt and then at times obovate, base acute, margin closely toothed, teeth more than 30 on each side, 3–5 in. long, 1–2¼ in. wide, when young with a covering of tawny-grey stellate hairs, soon becoming glabrous, when full grown nearly to quite glabrous above, beneath with a few scattered hairs on the midrib and nerves and minutely yellow-glandular; lateral nerves 6–10 on each

side of the midrib; petiole about $\frac{1}{3}$ in. long. *Panicles* contracted, subglobose, $\frac{3}{4}$–$1\frac{1}{2}$ in. across, uniformly beset with stellate hairs, the tomentum much looser upwards; peduncle $\frac{1}{3}$–$\frac{2}{3}$ in. long; pedicels $\frac{1}{16}$–$\frac{1}{10}$ in. long; bracts about as long as the pedicels. *Calyx* obovate-oblong, $\frac{1}{12}$–$\frac{1}{10}$ in. long, 4-lobed; lobes subacute or obtuse, loosely beset with white stellate hairs. *Corolla* $\frac{1}{7}$–$\frac{1}{6}$ in. long; lower portion of the tube cylindric, very short, but nearly twice as long as the widened upper portion; limb lilac, lobes rounded, short. *Anthers* very short, distinctly exserted, dehiscing throughout their length. *Fruit* about $\frac{1}{6}$ in. across, lilac.

Fig. 1, portion of an inflorescence; 2, section of calyx, showing ovary; 3 and 4, stamens; 5, fruits; 6, seed;—*all enlarged.*

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2

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M.S. del. J.N. Fitch. lith.

Vincent Brooks, Day & Son Lt.d imp.

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Tab. 8683.

DENDROBIUM Palpebrae.

Burma.

Orchidaceae. Tribe Epidendreae.

Dendrobium, *Swartz*; *Benth. et Hook. f. Gen. Plant.* vol. iii. p. 498.

Dendrobium Palpebrae, *Lindl. in Journ. Linn. Soc.* vol. v. p. 33 (1850); *Paxt. Fl. Gard.* vol. i. p. 48; *Veitch, Man. Orch.* pars iii. p. 67; *Hook. f. Flor. Brit. Ind.* vol. v. p. 750; *Rolfe in Orch. Rev.* 1896, pp. 73, 142; a *D. Farmeri*, Paxt., pseudobulbis gracilioribus, racemis et pedicellis brevioribus, floribus minoribus, sepalis petalisque albis, labello prominenter ciliato differt.

Herba epiphytica, 15–20 cm. alta. *Pseudobulbi* aggregati, elongati, subgraciles, sulcati, vaginis membanaceis vestiti, apice 2–3-phylli. *Folia* lanceolato-oblonga, acuta, 7–10 cm. longa, 2–3 cm. lata. *Racemi* suberecti, 8–10 cm. longi, multiflori. *Bracteae* anguste oblongae, 6–7 mm. longae. *Pedicelli* 1·5–2 cm. longi. *Flores* speciosi, albi, labelli disco flavo vel aurantiaco. *Sepala* elliptico-oblonga, circiter 1 cm. longa. *Petala* ovato-elliptica, sepalis latiora. *Labellum* breviter unguiculatum, ovato-orbiculare, subacutum, basi pubescens, margine prominenter ciliato. *Columna* lata, brevis; pollinia ea generis.—*Dendrobium Farmeri album*, Regel, Gartenfl. vol. xvii. p. 321, t. 595.—R. A. Rolfe.

The *Dendrobium* here figured is a Burmese species which has never been common in Orchid collections, doubtless owing to the circumstance that it has rarely been met with in the wild state. It was originally received by Messrs. J. Veitch and Sons from Moulmein and flowered in their nursery for the first time in November, 1849. It was shortly afterwards described by Professor Lindley, whose name *D. Palpebrae* has reference to the 'eye-lash' fringe of the lip. There is proof that the species had been received at the Royal Botanic Garden, Calcutta, from Burma, by Dr. T. Anderson, who has recorded its flowering there in December, 1862. The original specimen obtained by Messrs. Veitch appears to have been found by Mr. T. Lobb; the name of the collector who obtained the Calcutta plant referred to is not recorded. There is also evidence that Surgeon-Major Jerdon had a living plant in his private collection in Madras, though neither the

date of its flowering nor the provenance of his plant has been recorded. In Europe it appears to have been lost sight of until 1868 when the species was figured by the late Professor Regel as *D. Farmeri album* from a plant introduced from Moulmein by Messrs. Hugh Low and Company. Subsequently it is known to have been obtained from Moulmein by Major-General E. Berkeley and Mr. G. M. Peché and perhaps others, but in India, at least, its identity was not ascertained: Jerdon's plant was believed to be a form of *D. densiflorum*, Wall.; that of Anderson was supposed to be *D. Griffithianum*, Lindl.; Peché's plant was identified with *D. Farmerii*, Paxt. The confusion was increased by the publication of a figure of a Sikkim form of *D. Farmerii* by Sir J. D. Hooker (Ann. Roy. Bot. Gard. Calcutta, vol. v. p. 14, t. 22), under the name *D. Palpebrae*, in 1895, and although this identification was corrected by Sir G. King and Mr. Pantling in 1898 (l.c. vol. viii. p. 57), the position of the true *D. Palpebrae*, Lindl., was left somewhat obscure. The plant from which our figure has been prepared is one that has been long in cultivation at Kew, where it thrives well in a tropical house under the conditions suitable for *D. densiflorum*, *D. thyrsiflorum* and other nearly related species. Its precise origin is unknown.

DESCRIPTION.—*Herb*, epiphytic, 6–8 in. high; pseudobulbs clustered, elongated, rather slender, sulcate, clothed with membranous sheaths, each with 2–3 subterminal leaves. *Leaves* lanceolate-oblong, acute, 3–4 in. long, $\frac{3}{4}$–$1\frac{1}{4}$ in. wide. *Racemes* suberect, 3–4 in. long, many-flowered; bracts narrow-oblong, about $\frac{1}{4}$ in. long; pedicels $\frac{2}{3}$–$\frac{3}{4}$ in. long. *Flowers* showy, white, the lip with a yellow or orange disk. *Sepals* elliptic-oblong, over $\frac{1}{3}$ in. long. *Petals* ovate-elliptic, wider than the sepals. *Lip* short-clawed, ovate-orbicular, somewhat acute, pubescent at the base, with a markedly ciliate margin. *Column* broad, short; pollinia as in the genus.

Fig. 1, lip, showing the fringe; 2, column, with its foot; 3, anther-cap; 4 and 5, pollinia, seen from in front and from behind:—*all enlarged*.

M.S. del. J.N. Fitch lith.

Vincent Brooks, Day & Son Lit.ers imp

Tab. 8684.

TELOPEA oreades.

Australia.

Proteaceae. Tribe Embothrieae.

Telopea, *R. Br.*; *Benth. et Hook. f. Gen. Plant.* vol. ii. p. 184.

Telopea oreades, *Muell. Sixth Syst. Ind. Pl. Victoria*, p. 18 (nomen); *Fragm. Phyt.* vol. ii. p. 170; *Key Syst. Vict. Pl.* vol. i. p. 277; vol. ii. p. 29, fig. 72; *Pl. Indig. Victoria* (*cont. Ewart*) vol. ii. p. 10, t. 73; *Benth. Fl. Austral.* vol. v. p. 435; *Maiden, For. Fl. N.S.W.* vol. v. p. 69 (exempl. e Gippsland tantum), t. 163, fig. N; affinis *T. speciosissimae*, R Br., sed foliis integris obscure nervosis bracteis minoribus forma diversis distincta; a *T. truncata*, R. Br., glabritie bractearum et foliorum forma distat.

Arbor 9–12 m. alta, ramis sub racemis primo adpresse fulvo-pubescentibus mox glabrescentibus caeterum glabris cortice nigricante obtectis. *Folia* lineari-oblonga vel oblanceolata, basi sensim in petiolum abeuntea, acuta vel obtusa, integra, 15–20 cm. longa, 3–5 cm. lata, coriacea, supra saturate viridia, subtus pallidiora vel subglauca, nervis venisque plerumque obscuris; petiolus 1–2·5 cm. longus, fusco-puberulus. *Flores* in racemum capituliformem basi bracteis involucratum dispositi; rhachis glabra; bracteae exteriores ovatae, interiores oblongae, cuspidato-acuminatae, subcoriaceae, glabrae, rubrae vel rubescentes, intus increscentes, fere ad 4 cm. longae; pedicelli 1–25 cm. longi, glabri. *Perianthium* kermesinum ante anthesin ipsam tubulosum, modice incurvum, circiter 2·5 cm. longum, glaberrimum, mox uno latere ad basi fissum; limbus revolutus, 6–8 mm. longus, 4-fidus, segmentis spathulatis subacutis 2 interioribus paulo minoribus. *Antherae* late ovatae. *Glandulae* hypogynae alte connatae, ovarii basin uno latere cingentes. *Pistillum* ad 3·5 cm. longum, apice paulo incrassatum, uno latere stigma papillosum gerens. *Fructus* follicularis, pedicello recurvato insidens, oblongus, stylo coronante dempto circiter 7 cm. longus. *Semina* circiter 15, ellipsoidea, truncata, 8–10 mm. longa, ala terminali late lineari ad 3 cm. longa.—O. Stapf.

The Gippsland Waratah was first discovered by the late Baron von Müller at Nangutta Creek and Weatherhead, according to Mr. Maiden within New South Wales. It has, however, been met with frequently since in Gippsland, whence its name, and is undoubtedly a Victorian species. The plant which Maiden has figured as *Telopea oreades*, found at Braidwood, a hundred miles north of Gippsland, is rather different; it has narrower leaves and a rusty pubescence, as in *T. truncata*, R. Br., from Tasmania. The most northerly Waratah is *T. speciosissima*, R. Br., between Hunter and Shoalhaven Rivers in New South Wales. The Braidwood and the Gippsland plants inhabiting intermediate stations exhibit

somewhat intermediate characters. Nearly thirty years ago Müller suggested that the Gippsland Waratah should be tried in the open in sheltered situations in England, and the Rev. Mr. Boscawen of Ludgvan Rectory, Cornwall, has shown that the Baron's suggestion was practical. From seed received in 1910 Mr. Boscawen raised a plant which, when six inches high, he planted out in a warm position in a mixture of bog earth, leaf mould and granite sand. This plant is now fifteen feet high, and in 1916 bore over thirty flower heads, from some of which it is hoped seeds may ripen. The material for our plate came from this plant in 1915, in which year Mr. Boscawen also succeeded in inducing *T. speciosissma* to flower.

DESCRIPTION.—*Tree*, 30–40 ft. high; twigs close under the flower-heads, at first clothed with a close tawny pubescence which soon disappears, elsewhere glabrous; bark very dark coloured. *Leaves* linear-oblong or oblanceolate, gradually narrowed to the petiole, acute or obtuse, entire, 6–8 in. long, $1\frac{1}{4}$–2 in. wide, leathery, deep green above, paler or somewhat glaucous beneath, nerves and veins inconspicuous; petiole $\frac{1}{3}$–1 in. long, tawny-puberulous. *Flowers* in capitulate racemes with a whorl of basal bracts; rachis glabrous; outer bracts ovate, inner bracts oblong, cuspidate-acuminate, firm, glabrous, red or reddish, thickened within, about $1\frac{1}{2}$ in. long; pedicels $\frac{1}{2}$ in. long, glabrous. *Perianth* crimson, tubular before opening, slightly incurved, about 1 in. long, quite glabrous, soon splitting to the base on one side; limb revolute, $\frac{1}{4}$–$\frac{1}{3}$ in. long, 4-fid; lobes spathulate, somewhat acute, the 2 inmost rather the smaller. *Anthers* wide ovate. *Hypogynous glands* much united, surrounding the base of the ovary on one side. *Pistil* about $1\frac{1}{3}$ in. long, slightly thickened at the tip, with a papillose stigma at one side. *Fruit* follicular, supported by the recurved pedicel, oblong, about $2\frac{3}{4}$ in. long not including the persistent style. *Seeds* about 15, ellipsoid, $\frac{1}{3}$–$\frac{2}{5}$ in. long, with a wide-linear terminal wing over 1 in. long.

Fig. 1, flower-bud; 2, flower; 3, part of the perianth, with stamens; 4, pistil; 5, longitudinal section of ovary; 6, ovule:—*all enlarged.*

M S del. J.N Fitch. lith

Vincent Brooks, Day & Son Lt.d imp.

L. Reeve & Co. London

Tab. 8685.

CYTISUS monspessulanus.

Mediterranean region.

Leguminosae. Tribe Genisteae.

Cytisus, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. i. p. 484.

Cytisus monspessulanus, *Linn. Sp. Pl.* ed. i. p. 740; *Briq. Étud. Cytis. Alp. Marit.* p. 141; *Reichb. Ic. Flor. Germ.* vol. xxii. t. 2079, figs. i. & ii.; *Aschers. & Graebn. Syn. Mitteleurop. Fl.* vol. vi. Abt. ii. p. 297; *Schneider, Laubholzk.* vol. ii. p. 41, figs. 27 e–h, 28, d; *Bean, Trees and Shrubs,* vol. i. p. 460; a *C. Hosmariensi* altera specie subsectionis *Phyllotelinae,* Briq., differt foliolis minoribus subtus haud dense sericeis, floribus minoribus, vexillo sericeo.

Frutex 1–3 m. altus, ramosisssimus, ramis prominenter striatis, junioribus patule pubescentibus. *Foliola* obovata vel obovato-oblonga, obtusa vel obtusiuscula, apiculata, 10–20 mm. longa, 5–8 mm. lata, supra glabra, subtus pubescentia. *Flores* 3–9, in ramulis lateralibus fasciculati vel subumbellati; pedicelli vix 2 mm. longi, villosuli, medio minute bracteati, apice 2-bracteolati. *Calyx* 2-labiatus, 4–5 mm. longus, villosulus, labii superioris dentibus minutis intermedio longiore, inferioris segmentis triangularibus. *Corolla* lutea, 8–9 mm. longa, petalis subaequilongis, vexillo late ovato vel rotundato-elliptico glabro, alis glabris, carina obtusa superne parce sericea. *Legumen* 2–3 cm. longum, 4 mm. latum, hirsuto-sericeum.—*C. candicans,* Lam. & DC., Fl. Franc. vol. iv. p. 504. *Genista candicans,* Linn. Cent. i. 609; Amoen. Acad. vol. iv. p. 284. *Teline candicans,* Webb in Webb & Berth. Phyt. Canar. vol. ii. p. 35. *T. monspessulana,* C. Koch, Dendrol. vol. i. p. 30.—O. Stapf.

According to Sweet the Broom here figured was introduced into England in 1735, but in the third edition of the Gardeners' Dictionary published that year Miller alludes to it as the Base Tree Trefoil of Montpellier and already established in this country. It was still to be found wild at Graumont near Montpellier up to forty years ago, but owing to the clearing of the land was hardly able to maintain itself. Its natural area extends from the Canaries to Algeria and Spain and thence throughout the Mediterranean region to Greece, while a peculiar variety occurs in Syria. Tournefort towards the close of the seventeenth century was the first author to associate the plant particularly with Montpellier, whence the name *Cytisus monspessulanus* first used by

Linnaeus. But Cesalpini a century earlier has termed it *C. sylvestris candicans*, a circumstance which explains the name *Genista candicans*, employed by Linnaeus when some years later he transferred the plant to the latter genus. Although *C. monspessulanus* has been in cultivation for nearly two centuries it has never, owing to its tenderness, become a common shrub. A few succeeding mild winters allow it to develop into a bush six feet high, and then it makes a bright display when in flower during the second and third weeks of May. But it rarely survives the effects of fifteen to twenty degrees of frost, so that sooner or later it has to be replaced. This is easily arranged for, as seeds, at least from cultivated specimens, are easily obtained from southern France. It likes the sunniest possible position and does not require rich soil or feeding at the root. It rarely ripens its seed at Kew.

DESCRIPTION.—*Shrub*, 3–10 ft. high, much branched, the twigs distinctly striate and at first clothed with spreading hairs. *Leaflets* obovate or obovate-oblong, more or less obtuse, apiculate, $\frac{1}{3}$–$\frac{3}{4}$ long, $\frac{1}{5}$–$\frac{1}{3}$ in. wide, glabrous above, pubescent beneath. *Flowers* in clusters, sometimes almost umbellate, of 3–9 on specialised lateral twigs; pedicels hardly $\frac{1}{12}$ in. long, rather villous, minutely bracteate about the middle, 2-bracteolate at the tip. *Calyx* 2-lipped, $\frac{1}{6}$–$\frac{1}{5}$ in. long, rather villous; teeth of the upper lip minute, the central rather longer than the others, those of the lower lip triangular. *Corolla* yellow, $\frac{1}{3}$ in. long; petals nearly of the same length, the standard wide-oblong or rounded-elliptic and glabrous, the wings glabrous, the keel blunt and sparingly silky upwards. *Pod* $\frac{3}{4}$–$1\frac{1}{4}$ in. long, $\frac{1}{6}$ in. wide, silkily hairy.

Fig. 1, a flower, the petals removed; 2, standard; 3, wing-petal; 4, keel-petal; 5, pistil:—*all enlarged.*

Brookes, Day & Son Lt.d imp

Tab. 8686.

CLEMATIS afoliata.

New Zealand.

Ranunculaceae. Tribe Clematideae.

Clematis, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. i. p. 3.

Clematis afoliata, *J. Buch. in Trans. N.Z. Inst.* vol. iii. p. 211 (1871); *T. Kirk, Students' Fl.* p. 3; *Cheeseman, Man. N.Z. Fl.* p. 5; caulibus aphyllis distincta.

Frutex scandens caulibus ramulisque longis saepius dense intertextis. *Ramuli* graciles, rigidi, striati, glabri. *Folia* in planta matura saepissime ad petiolos redacta, rarius foliola tria minuta longipetiolulata ovata vel triangularia gerentia; folia in plantis juvenibus saepius majora; petioli graciles, 2–10 cm. longi. *Flores* dioici, in axillis fasciculati, binati ad quinati, rarius solitarii, viridulo-albi, 2–3 cm. diametro; pedunculi basi perulati, apice bibracteolati, ut pedicelli densiuscule pilosi. *Flores* ♀: *Sepala* 4, lanceolata, acuta, circiter 1·5 cm. longa, extra sericea. *Staminodia* pauca filamentis valde applanatis, antheris effoetis oblongo-linearibus. *Pistilla* numerosa. *Ovarium* pilosum. *Achaenia* ovoidea, sericea. *Flores* ♂: *Antherae* (teste *Cheeseman*) lineares.—*C. aphylla*, Colens. in Trans. N.Z. Inst. vol. xix. p. 259 (1886).—T. A. Sprague.

Clematis afoliata exhibits an interesting stage in the development of aphylly in which only the leaflets are suppressed, whilst the petioles are fully developed. The New Zealand species of *Clematis* are all endemic and all dioecious and are mostly difficult to discriminate, both on account of the separation of the sexes, and because of the polymorphy of their foliage. *C. afoliata* is, however, readily recognizable on account of its leafless appearance; according to Cheeseman, it often forms dense masses of intertwined stems and branches several feet in length. For the material for our illustration we are indebted to Miss Willmott, in whose garden at Warley Place, Great Warley, Essex, *C. afoliata*, grown on a sunny wall, is, when in full flower, a very striking plant. For its introduction, Miss Willmott informs us, her garden was indebted to her uncle, Mr. Charles Willmott, who sent its seeds from New Zealand nearly forty years ago. An interesting addition to outdoor collections, this species will require protection during winter except perhaps in

the warmer south-western districts of the United Kingdom.

DESCRIPTION.—*Shrub*, stems and branches long, often intricately interlaced; twigs slender, stiff, striate, glabrous. *Leaves* in full-grown plants usually reduced to petioles, rarely furnished with 3 minute long-petioluled ovate or triangular leaflets; in young plants the leaves often well developed; petioles slender, $\frac{3}{4}$–4 in. long. *Flowers* dioecious, in fascicles of 2–5, rarely solitary, in the leaf-axils, greenish-white, $\frac{3}{4}$–$1\frac{1}{4}$ in. across; peduncles perulate at the base, 2-bracteolate at the apex, rather densely hairy throughout. *Female* flowers: *Sepals* 4, lanceolate, acute, about $\frac{2}{3}$ in. long, silky outside. *Staminodes* few, their filaments much flattened; anthers oblong-linear, sterile. *Pistils* numerous. *Ovary* pilose. *Achenes* ovoid, silky. *Male* flowers: *Anthers*, according to Cheeseman, linear.

Fig. 1, tip of leafless petiole; 2, bracteoles; 3, sepal; 4, staminode; 5, carpel:—*all enlarged.*

M S del. J.N. Fitch lith.

Vincent Brooks, Day & Son Lit.d imp.

L. Reeve & Co. London.

Tab. 8687.

ARTANEMA longifolium.

Tropical Asia and Tropical Africa.

Scrophulariaceae. Tribe Gratioleae.

Artanema, *Don*; *Benth. et Hook. f. Gen. Plant.* vol. ii. p. 953.

Artanema longifolium, *Vatke in Linnaea*, vol. xliii. p. 307 (var.); *Engl. Pfl. Ost-Afr.* C, p. 357; ab *A. fimbriato*, Don, foliis multo latioribus saepe distincte petiolatis, pedicellis paulo brevioribus, corollae majoris tubo minus attenuato lobisque postico emarginato excepto integerrimis differt.

Herba perennis, erecta, parce ramosa, 3 dm.–1 m. alta. *Caulis* acute quadrangularis, late 2-sulcatus, ad angulos leviter scabridulus. *Folia* opposita, petiolata vel superiora subsessilia, oblongo-lanceolata vel late lanceolata, apice acuta vel acuminata, basi attenuata, plus minusve serrata, supra saepe leviter scabridula, 5–13 cm. longa, 1·2–4 cm. lata; petiolus ad 2 cm. longus. *Racemus* terminalis, strictus, sat laxe multiflorus, 4–13 cm. longus; bracteae ovatae, lanceolatae vel subulatae, 4–12 mm. longae; pedicelli arcuato-ascendentes, 4–12 mm. longi, minute hispiduli. *Calyx* 5-partitus, 7–9 mm. longus, saepe minute hispidulus, impresso-punctatus; lobi imbricati, ovato-lanceolati, acuminati. *Corolla* atropurpurea vel lilacino-violacea, extra pilis brevissimis glandulosis albis dense conspersa, intus pallidiora; tubus infundibuliformis, 2–3 cm. longus, basin versus annulo fovearum 5 profunde constrictus; limbus leviter 2-labiatus, 4-lobatus; lobi plus minusve patentes, late ovati vel rotundati, ad 1 cm. longi et 1·2 cm. lati, postico emarginato excepto integerrimi. *Stamina* 4, 2 postica tubo inclusa, 2 antica sub lobo postico conniventia, filamentorum basi squama lata instructa; antherae per paria cohaerentes, loculis divergentibus apice confluentibus. *Ovarium* ovoideum, 4 mm. longum, glabrum, basi disco pallide luteo incrassato cinctum; stylus corollae tubo paulo brevior, apice 2-lamellatus. *Capsula* subglobosa, ad 10 vel 12 mm. diam. —*A. sesamoides*, Benth. Scroph. Ind. p. 39, et in DC. Prodr. vol. x. p. 408; Wight, Ic. t. 1410; Hook. f. Flor. Brit. Ind. vol. iv. p. 274; Skan in Dyer Flor. Trop. Afr. vol. iv. sect. 2, p. 327. *A. longiflorum*, Wettst. in Engl. & Prantl, Pflanzenfam. vol. iv. 3 B, p. 79. *Columnea longifolia*, Linn. Mant. p. 90. *Sesamum javanicum*, Burm. f. Fl. Ind. p. 133. *Achimenes sesamoides*, Vahl. Symb. Bot. vol. ii. p. 71. *Diceros longifolius*, Pers. Syn. vol. ii. p. 164. *Bahelia longifolia*, O. Kuntze, Rev. Gen. vol. ii. p. 458.—S. A. Skan.

The small genus *Artanema*, comprising only three or four species, is closely allied to *Torenia*, differing chiefly in having a deeply divided calyx with imbricate lobes, and a rather large flattened appendage at the base of the filaments of the two anterior stamens, while in *Torenia* the obliquely 3–5-toothed or 2-lipped calyx is tubular and is plicate or winged, and the appendage at

the base of the filaments is a bristle-like tooth. It was established by D. Don in 1834 on a plant raised in the Edinburgh Botanic Garden from seeds received in 1830 from Mr. Charles Fraser, who collected them on the banks of the River Brisbane at Moreton Bay, Queensland. This plant was first described by Graham in 1831 as *Torenia fimbriata*, and later in the same year was figured at plate 3104 of this Magazine under the name of *T. scabra*, Graham. It is probable that this species (*Artanema fimbriatum*, Don) is not now in cultivation. *A. longifolium* is widely distributed in India, occurring in the Deccan Peninsula from the Concan southwards; it is also met with in Lower Burma, Ceylon, Sumatra, Java, Borneo and the Philippine Islands. In West Tropical Africa it ranges from the Gold Coast to the Cameroons, extending to the Upper Congo, while the variety *amplexicaule*, Skan, with amplexicaul or semi-amplexicaul leaves, is known from British East Africa. Seeds of the plant figured were sent to Kew from Nigeria in 1914 by Mr. S. W. Dunn of the Audit Office, Calabar. Flowers were produced in a warm house in July, 1915, and again during the summer of 1916. In cultivation it ripens seeds freely. Collectors describe the colour of the flowers as lilac-violet or dark purple, while Barter, referring to a specimen collected by him in Southern Nigeria, stated that it had deep crimson flowers. This specimen is in the Kew Herbarium and appears to be identical with *A. longifolium*. The colour of the flowers cannot now be determined. According to Miller the vernacular name of the plant in Lagos is Sokoyokoto and its leaves are used as a vegetable by the natives.

DESCRIPTION.—*Herb*, perennial, erect, sparingly branched, 1–3 ft. high. *Stem* acutely 4-angled, widely 2-sulcate, angles slightly scabrid. *Leaves* opposite, petioled or the uppermost nearly sessile, oblong-lanceolate or wide lanceolate, acute or acuminate, base narrowed, margin more or less serrate, often faintly scabrid above, 2–5 in. long, $\frac{1}{2}$–$1\frac{1}{2}$ in. wide; petiole up to $\frac{3}{4}$ in. long. *Raceme* terminal, strict, rather laxly many-flowered, $1\frac{1}{2}$–5 in. long; bracts ovate, lanceolate or subulate, $\frac{1}{6}$–$\frac{1}{2}$ in. long; pedicels curved-ascending, $\frac{1}{6}$–$\frac{1}{2}$ in. long, finely

hispidulous. *Calyx* 5-partite, about $\frac{1}{3}$ in. long, often finely hispidulous, punctate; lobes imbricate, ovate-lanceolate, acuminate. *Corolla* dark purple or lilac-violet, densely beset outside with white short glandular hairs, paler within; tube funnel-shaped, $\frac{3}{4}$–$1\frac{1}{4}$ in. long, near the base narrowed by a ring of 5 pits; limb slightly 2-lipped, 4-lobed; lobes somewhat spreading, wide-ovate or rounded, over $\frac{1}{3}$ in. long, $\frac{1}{2}$ in. wide, the upper emarginate, the others entire. *Stamens* 4, the 2 posterior included, the 2 anterior connivent under the upper corolla-lobe; filaments with a broad basal scale; anthers cohering in pairs, their cells divergent and confluent at the tip. *Ovary* ovoid, $\frac{1}{6}$ in. long, glabrous, surrounded at the base by a pale yellow thickened disk; style rather shorter than the corolla-tube, 2-lamellate at the top. *Capsule* subglobose, nearly $\frac{1}{2}$ in. in diameter.

Fig. 1, calyx and pistil; 2, base of corolla, laid open; 3 and 4, anthers; 5, ovary and disk; 6, transverse section of ovary:—*all enlarged.*

M.S. del J.N. Fitch. lith.

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Tab. 8688.

ROSA cerasocarpa.

China.

Rosaceae. Tribe Roseae.

Rosa, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. i. p. 625.

Rosa (§ Synstylae) **cerasocarpa**, *Rolfe in Kew Bulletin*, 1915, p. 89; **a *R. longicuspidi*, Bert., foliolis paucioribus et majoribus, sepalis angustioribus, et fructibus minoribus differt.**

Frutex scandens vel subscandens, alta. *Rami* glauci vel subglauci, aculeis validis recurvis basi late dilatatis sparse armati. *Folia* 12–18 cm. longa, 5-foliolata vel rarissime 3-foliolata, rhachis breviter glandulosa et sparse aculeata; foliola breviter petiolulata, ovata vel elliptico-ovata, acuminata, argute serrata, glabra vel subglabra, subcoriacea, 5–10 cm. longa, 2·5–5 cm. lata, subtus glaucescentia, venis prominentibus; stipulae adnatae, angustissimae, apice liberae, divergentes et acuminatae, marginibus sparse glandulosis. *Flores* 2·5–3 cm. diametro, in cymas terminales corymbiformes 8–15 cm. diametro multifloras dispositi; pedicelli 2–4 cm. longi, crebre glandulosi. *Receptaculum* anguste obovoideum, 4 mm. longum, villosum et glandulosum. *Calycis* lobi oblongo-lanceolati, acuminati vel caudato-acuminati, pubescentes et glandulosi, interdum pinnatisecti, 7–8 mm. longi, reflexi. *Petala* cuneato-obcordata, alba, circiter, 1·2 cm. longa. *Filamenta* glabra, 7–8 mm. longa. *Carpella* copiose villosa; styli in columnam connati, 6 mm. longi. *Fructus* globosus, saturate ruber, circiter 1 cm. longus, calycis lobis et stylis deciduis.—R. A. Rolfe.

The Rose here figured is a member of the *Synstylae*, and is one of the group whereof the well-known *Rosa moschata*, Herm., figured at t. 7241 of this work, is the type. The material for our plate was supplied by Sir W. T. Thiselton-Dyer, The Ferns, Witcombe, who informs us that his plant was obtained originally from China through the late Sir Thomas Hanbury, La Mortola. The flowering branch figured was received in June, the fruiting spray in November, 1914. The plant has thriven well under the conditions suitable for *R. moschata*, and when in full blossom is singularly pleasing. Like other members of the group to which *R. moschata* belongs, the present species, described by Mr. Rolfe as *R. cerasocarpa*, from the plant here figured, is difficult to delimit. When the original account was prepared Rolfe identified as belonging to his new species a specimen in fruit

collected by Mr. A. Henry at Ichang in Central China (*Henry* n. 2952) and with some hesitation referred to it a second specimen obtained by the same traveller in North Patung (*Henry* n. 7007). The latter, however, has a rather more ellipsoid fruit, and Rehder and Wilson have recently referred it to *R. Rubus*, Lev. and Vaniot, a species previously known only from the original specimen, collected at Kouy-tcheou by the Abbé Martin, which, according to its authors, has the styles free. At the same time Rehder and Wilson (Pl. Wils. vol. ii. p. 312) have treated *R. cerasocarpa* itself as a form of *R. Gentiliana*, Lev. and Vaniot, a species met with at Kiang-seu by the Abbé d'Argy. But the Rose now described differs from the original specimen of *R. Gentiliana*, figured by Miss Willmott in her monograph of the genus *Rosa*; in our plant the leaflets are longer, more acuminate, and of a firmer texture; the stipules are narrower and less fimbriate; the pedicels are more densely glandular.

DESCRIPTION.—*Shrub*, tall and scandent or subscandent; branches more or less glaucous, sparingly beset with stout, recurved, wide-based prickles. *Leaves* 5–7 in. long, 5-foliolate or occasionally only 3-foliolate; rachis shortly glandular and sparingly prickly; leaflets shortly petiolulate, ovate or elliptic-ovate, acuminate, sharply serrate, glabrous or nearly so, subcoriaceous, 2–4 in. long, 1–2 in. wide, glaucescent beneath, prominently veined; stipules adnate, very narrow, free divergent and acuminate above, their margins sparingly glandular. *Flowers* 1–1$\frac{1}{4}$ in. wide, in terminal corymbiform many-flowered cymes 3–6 in. across; pedicels $\frac{3}{4}$–1$\frac{1}{2}$ in. long, closely glandular. *Receptacle* narrow-obovoid, $\frac{1}{6}$ in. long, villous and glandular. *Calyx-lobes* oblong-lanceolate, acuminate or caudate-acuminate, pubescent and glandular, at times pinnatisect, about $\frac{1}{3}$ in. long, reflexed. *Petals* white, cuneate-obcordate, about $\frac{1}{2}$ in. long. *Filaments* glabrous, about $\frac{1}{3}$ in. long. *Carpels* very villous; styles united in a column, $\frac{1}{4}$ in. long. *Fruit* globose, deep red, over $\frac{1}{3}$ in. long; calyx-lobes and styles deciduous.

Fig. 1, vertical section of a flower, the petals removed; 2 and 3, stamens; 4, carpels; 5, a fruit; 6, an achene:—*all enlarged*.

M.S.del. J.N.Fitch. lith

Vincent Brooks Day & Son Ltd imp.

L.Reeve & Cº London.

HUNTLEYA citrina.

Columbia.

Orchidaceae. Tribe Vandeae.

Huntleya, *Lindl. in Bot. Reg.* sub t. 1991. Zygopetalum § Huntleya, *Benth. et Hook. f. Gen. Plant.* vol. iii. p. 543.

Huntleya citrina, *Rolfe*; ab *H. apiculata*, Rolfe (Batemannia apiculata, *Reichb. f.*) floribus citrinis nec albis, et labelli dentibus valde incurvis differt.

Herba epiphytica. *Folia* numerosa, disticha, suberecta, oblanceolato-oblonga, acuta, 15–22 cm. longa, 2–2·8 cm. lata, plicata, pallide viridia, basi attenuata et conduplicata. *Flores* axillares, solitarii, citrini, labelli crista sanguinea. *Bracteae* lanceolatae, acutae, in axillis foliorum inclusae. *Pedicelli* circiter 5 cm. longi. *Sepala* patentia, ovata, acuta, circiter 2 cm. longa. *Petala* elliptico-ovata, acuta, sepalis subaequalibus. *Labellum* breviter unguiculatum, 1·5 cm. longum, trilobum; lobus intermedius late ovatus, apiculatus, circiter 1·5 cm. latus; lobi laterales auriculati, suberecti, breves, marginibus in dentibus subulatis valde incurvis extensis antice cum crista denticulata continuis. *Columna* incurva, circiter 0·5 cm. longa, alis auriculatis. *Pollinia* 4, pyriformia, glandula pandurato-oblonga affixa.—R. A. Rolfe.

The attractive Orchid here figured has a somewhat obscure history. It formed part of the collection of the late Sir Trevor Lawrence at Burford, Dorking, and was one of the species which the late Lady Lawrence presented to Kew in 1914. In the Burford collection it was grown as a *Chondrorhyncha*, though there was no evidence as to whence the plant had come or by whom this name had been suggested. At Kew it has thriven well in a tropical house under the conditions suitable for species of *Zygopetalum*, and in July, 1915, it produced the flowers which enabled our figure to be prepared. In the orchid collection of the late Consul F. C. Lehmann, Mr. Rolfe has found two drawings of the species here represented. Neither has been named, but one of them bears a reference by Lehmann to an unnumbered and unnamed specimen, and this specimen is in turn accompanied by a cross reference to the unnumbered drawing. The Lehmann herbarium contains two other specimens of the same species, one referred to the genus *Huntleya*, the other to *Batemannia*. Thus all three Lehmann specimens, as well

as the Lehmann drawing, belong to the species grown at Burford as a *Chondrorhyncha*. The plant, for which hitherto no specific name has been proposed, belongs to the genus *Huntleya* of Lindley. This genus Reichenbach included in the genus *Batemannia* of Lindley, a view which Bentham was unable to accept, though he preferred to treat *Huntleya* as a section of *Zygopetalum*, Hook., rather than as a genus apart. The more ample material now available has led to the abandonment of Bentham's treatment, and *Huntleya* is now generally regarded as a valid and distinct genus. One species, *H. Burtii*, Rolfe, has already been figured at t. 6003 under the name *Batemannia Burtii*, Endr. & Reichb. f. The facts regarding *H. citrina*, the species here described, which have been adduced in this note, at least suggest the possibility that Sir Trevor Lawrence may have received it from Lehmann. A number of interesting Orchids did find their way to the Burford collection from Mr. Lehmann, among them the remarkable *Trevoria Chloris*, Lehm., figured at t. 7805 of this Magazine and the equally striking *Sievekingia Reichenbachiana*, Rolfe, figured at t. 7576.

DESCRIPTION.—*Herb*, epiphytic. *Leaves* numerous, distichous, suberect, oblanceolate-oblong, acute, 6–11 in. long, $\frac{3}{4}$–$1\frac{1}{8}$ in. wide, plicate, pale green, narrowed to the conduplicate base. *Flowers* axillary, solitary, pale yellow except for the blood-red crest of the lip; bracts lanceolate, acute, enveloped by the leaf-base; pedicels about 2 in. long. *Sepals* spreading, ovate, acute, about $\frac{3}{4}$ in. long. *Petals* elliptic-ovate, acute, about as long as the sepals. *Lip* shortly clawed, $\frac{2}{3}$ in. long, 3-lobed; mid-lobe wide-ovate, apiculate, about $\frac{2}{3}$ in. wide; lateral lobes auriculate, suberect, short, the margins, prolonged into subulate much incurved teeth, continuous in front with the denticulate crest. *Column* incurved, about $\frac{1}{3}$ in. long, its wings auriculate. *Pollinia* 4, pyriform, adnate to a pandurate-oblong gland.

Fig. 1, lip; 2, base of lip, showing the incurved marginal teeth continuous in front with the denticulate crest; 3, column; 4, anther-cap; 5, pollinia and gland;—*all enlarged*.

M.S. del. J.N. Fitch lith.

Vincent Brooks, Day & Son Lt.d imp.

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Tab. 8690.

SANGUISORBA obtusa, var. amoena.

Japan.

Rosaceae. Tribe Poterieae.

Sanguisorba, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. i. p. 624, *sub* Poterium; *Focke in Engl. & Prantl, Pflanzenfam.* vol. iii. pars 3, p. 44.

Sanguisorba obtusa, *Maxim. in Bull. Acad. Pétersb.* vol. xix. (1874), p. 160, var. **amoena,** *Jesson*; a planta typica statura robustiore, glabritie, spicis petiolulisque longioribus, foliolis subtus admodum glaucis differt.

Herba perennis, caulescens. *Caulis* usque ad 12 dm. altus, 7 mm. diametro, erectus, laxe ramosus vel simplex. *Folia* radicalia longe petiolata, 12–48 cm. longa, 5–16-foliolata; foliola obtuso-ovata vel elliptica, basi obtusa vel subcordata, 3·5–6 cm. longa, 2–5 cm. lata, supra pallide viridia, subtus admodum glauca, margine obtuse vel acute serrata, rhachis ad nodos parcissime pubescens; petioloti tenues, usque ad 2·5 cm. longi. *Spica* centrifuga, cylindrica, 5–9 cm. longa, rhachis tomentoso-pubescens; bracteae lanceolatae vel subspatulatae, apice acuminatae, 3 mm. longae, ciliatae, pilis albidis instructae; bracteolae 2, lineares, 2 mm. longae, pilis eis bractearum similibus. *Flores* sessiles, roseo-purpurei. *Sepala* 4, persistentia, orbiculata, 3 mm. longa, apice calloso-mucronata, 3-nervia, extra inferne pubescentia vel vetustiora fere glabra. *Receptaculi* tubus pubescens, quadrangularis. *Discus* inconspicuus. *Stamina* plerumque 6, calyce triplo vel quadruplo longiora, filamentis planis medio dilatatis, apice subito attenuatis e basi saepe plus minusve connatis. *Antherae* vix 1 mm. longae, roseae. *Stylus* calycem superans. *Stigmata* fimbriata. *Achaenium* coriaceum, 2 mm. longum; tubo calycis indurato, 4-gono.—E. M. Jesson.

The hardy perennial *Sanguisorba* here figured is a native of Japan which was first introduced into this country by Messrs. Barr and Sons, in whose nursery it flowered in August, 1910. Plants received from Messrs. Barr early in 1913 flowered at Kew for the first time in the summer of that year. It forms a plant of bushy habit, three to four feet high, and produces flowers freely throughout the summer months. So far no good seeds have been produced, but the plant is readily increased by division and grows freely in any position, in good soil. Typical *S. obtusa* has been found as a wild plant on Mt. Hayachine and elsewhere at elevations of from 5000 to 7500 feet feet above sea-level in the island of Nippon, and a variety, *S. obtusa*, var *albiflora*, has been described from Mt. Kurikoma, Rikuchu. The variety

here described is very closely allied to a form described by Professor Makino as *S. hakusanensis*, from Shirouma in the province of Shinano, which is probably also a variety of *S. obtusa*. Makino adverts to the close relationship which his plant bears to *S. obtusa*, but separates it specifically on account of the difference in the number of its stamens—nine to ten, and the colour of its anthers. A specimen in the British Museum, collected by Mr. H. Takeda, seems to indicate that the number of stamens is not a satisfactory character, and it has been pointed out by Velenovsky that in the genus *Sanguisorba* as a whole the number of stamens is variable; in late developed spikes, for example, reduction to even two stamens may occur. In the plant figured the filaments are often united, sometimes nearly to the apex.

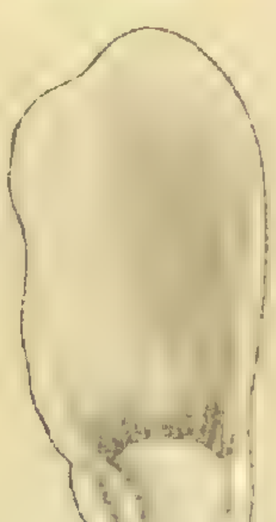
Description.—*Herb*, perennial; stem erect, 3–4 ft. high, simple or branched. *Leaves*: radical long-petioled, 5–20 in. long, 5–16-foliolate; leaflets bluntly ovate or elliptic, base obtuse or somewhat cordate, $1\frac{1}{2}$–$2\frac{1}{2}$ in. long, $\frac{3}{4}$–2 in. wide, pale green above, somewhat glaucous beneath, margin bluntly or sharply serrate, rachis sparingly pubescent at the attachment of the leaflets; petiolules slender, up to 1 in. long. *Spike* centrifugal, cylindric, 2–$3\frac{1}{2}$ in. long; rachis tomentose; bracts lanceolate or subspathulate, acuminate, $\frac{1}{8}$ in. long, ciliate with white hairs; bracteoles 2, linear, $\frac{1}{12}$ in. long, ciliate like the bracts. *Flowers* sessile, rose-purple. *Sepals* 4, persistent, orbicular, $\frac{1}{8}$ in. long, mucronate, the tip thickened, 3-nerved, sparingly pubescent outside near the base or when old almost glabrous. *Receptacle* with a pubescent, 4-angled tube. *Disk* inconspicuous. *Stamens* usually 6, 3–4 times as long as the calyx; filaments flat, widened in the middle, suddenly narrowed at the top, often more or less connate below. *Anthers* rose-coloured, very short. *Stigmas* fimbriate. *Achene* firm, $1\frac{1}{2}$ in long; persistent calyx-tube hardened, 4-angled.

Fig. 1 and 2, flowers; 3, vertical section of the same, with bases of stamens and style; 4, a compound stamen; 5 and 6, stamens;—*all enlarged except* 1, ***which is of natural size.***

2

1

3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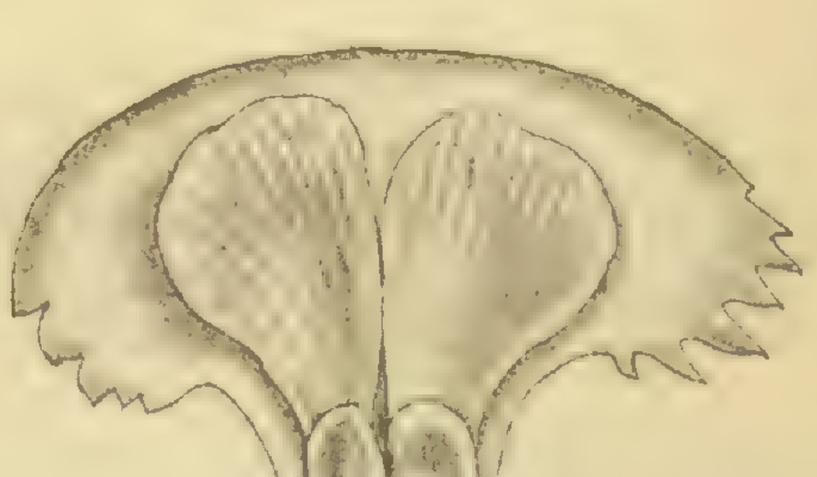
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Tab. 8691.

ABIES cephalonica.

Greece.

Coniferae. Tribe Abietineae.

Abies, *Juss.*, ex parte; *Benth. et Hook. f. Gen. Plant.* vol. iii. p. 441; *Eichl. in Engl. & Prantl, Naturl. Pflanzenfam.* vol. ii. pars i. p. 81.

Abies cephalonica, *Loud. Arboret. Brit.* vol. iv. p. 2325, fig. 2235, 2236; et *Gard. Mag.* vol. xiv. (1838), p. 81, fig. 6, 7, et vol. xv. (1839), p. 238, fig. 50–52; *Forbes, Pinet. Woburn.* 119, cum ic; *Link in Linnaea,* vol. xv. p. 530; *Carr. Conif.* p. 211 et ed. ii. p. 283; *Heldr. Nutzpfl. Greichenl.* p. 13 et *Fl. Céphal.* p. 67; *Henkel & Hochst. Syn. Nadelh.* pp. 180–183 (incl. vars. *a, parnassica* et *β, arcadica*); *C. Koch, Dendr.* vol. ii. pars ii. p. 225; *Spreitzenh. in Verh. Zool.-Bot. Ges. Wien,* vol. xxvii. (1877), p. 730; *Mast. in Gard. Chron.* 1884, vol. xxii. p. 592 cum ic., et *in Journ. R. Hort. Soc.* vol. xiv. p. 190; *Boiss. Fl. Or.* vol. v. p. 702; *Beissn., Nadeholzk.* p. 438, et ed. ii. p. 130; *Mouillef., Trait. Arbr. et Arbriss.* vol. ii. p. 1250, t. xxvi. (ter); *Veitch, Man. Conif.* p. 498; *Halácsy, Fl. Graec.* vol. iii. p. 450; *Elwes & Henry, Trees of Great Brit. & Irel.* vol. iv. p. 739, tab. 214; *Clinton-Baker, Ill. Conif.* vol. ii. p. 9 cum tab. 2; ab *A. pectinata,* DC., habitu et imprimis foliis subacutis, acutis vel cuspidatis, nunquam emarginatis distincta.

Arbor ad 30 m. alta, trunco ad 1 m. diametro, cortice griseo-brunneo demum in plagas oblongas parvas soluto; rami longi, horizontales vel superiores sursum curvati; ramuli glabri, primo virescentes, deinde cinerascentes. *Gemmae* ovoideae, obtusiusculae, ad 5 mm. longae, resinosae, perulis ovatis acutis ad ramulorum bases diu persistentibus. *Folia* per 7–9 annos persistentia, linearia, plerumque breviter acuta, rarius obtusa vel subacuta vel cuspidato-pungentia, 15–25 mm. longa, raro longiora recta, vel magis minusve curvata, crasse coriacea, supra saturate viridia, nervo medio leviter impresso, infra lineis duobus latis albis inter costam et margines depressis notata. *Strobili masculi* cylindrici, obtusi, 12–15 mm. longi, saturate vineo-purpurei. *Strobili feminei* solitarii vel 2–3-ni, cylindrici, circiter 5–7 cm. longi, 1·5–2 cm. crassi. *Carpella* sub anthesi spathulata, ad latera et in vertice denticulata, cuspide longiusculo reflexo vel versus strobilorum apices rigide patulo 3–5 mm. longo imposito. *Squamae ovuliferae* sub anthesi carpella cuspide dempto aequantes, ex ungue brevi lato valde dilatatae, latiores quam longae, ad margines laterales denticulatae, in vertice tenuiter rufo-velutinae. *Coni* cylindrici, obtusi vel apice conico-attenuati, 12–17 cm. longi, 3·5–5 cm. crassi, brunnescentes, interdum purpureo leviter suffusi; squamae maturae circiter 15–20 mm. longae, ad 25 mm. vel paulo ultra latae, forma paulo mutatae, quam carpella haud aucta cuspide dempto paulo longiores. *Semina* oblonga cum ala late oblonga truncata aequilonga circiter 15 mm. longa, purpureo-fuscescentia.—*A. luscombeana,* Hort. ex Loud. Arb. Brit. l. c. *A. Apollinis,* Link in Linnaea, vol. xv. (1841), p. 528; Antoine, Conif. p. 73; Heldr. l. c.; Unger, Reise Griechenl. pp. 90, 91, 121; K. Koch, l. c. p. 223; Boiss. l. c.; Halácsy in Verh. Zool.-Bot. Ges. Wien, 1888, p. 762. *A. peloponnesiaca,* Koch in Wochenschr. f. Gärtn. & Pflanzenk. vol. i. Gartennachr. p. 12 (nomen). *A. reginae Amaliae,* Heldr. in Regel, Gartenfl. 1860, p. 313, et

1861, p. 286 et Nutzpfl. Griechenl. p. 13; Seemann in Gard. Chron., 1861, p. 755; Fraas, Fl. Class. p. 262. *A. pectinata*, var. *graeca*, Fraas, l. c. *A. panachaica*, Heldr. in Regel Gartenfl. 1861, p. 286 et Nutzpfl. Griechenl. l. c. *Pinus Abies*, Dallaporta, Prosp., p. 124, non L. *P. Abies*, var. *Apollinis*, Endl. Conif. p. 98. *P. Abies*, β *cephalonica*, Parl. in DC. Prodr. vol. xvi. pars ii. p. 422. *P. cephalonica*, Antoine, Conif. p. 71, tab. 27, fig. 1; Endl. l. c.; Unger, Reise Griechenl. p. 121. *P. Picea*, Sibth. & Sm. Fl. Graec. vol. ii. p. 247; Chaub. & Spach., Exp. Scient. de Morée. p. 274; Fl. Pelop. p. 64, non L. *Picea cephalonica*, Loud. Arboret. Brit. p. 1039, fig. 1940–1946; Knight, Syn. Conif. p. 38; Gord. Pinet. p. 146; Murray in Proc. R. Hort. Soc. vol. iii. p. 141; Laws. Pinet. Brit. vol. ii. p. 175 cum ic. *P. kukunaria*, Wenderoth, Pfl. Bot. Gärt. p. 11. *P. Apollinis*, *P. panachaica* et *P. reginae Amaliae*, Murr. l.c.—O. Stapf.

The *Abies* which forms the subject of our illustration was first described as *A. cephalonica* in 1838 from specimens raised in England from seed sent home in 1824 by General Charles Napier, then Governor of Cephalonia. Loudon, the author of the species, at the time believed that it is confined to Cephalonia. It so happens that in the same year (1838) H. F. Link, then Director of the Botanic Garden at Berlin, collected on Mount Parnassos specimens of a Silver Fir which at first he considered identical with the tree from Cephalonia. But when he subsequently saw the figure of *A. cephalonica* given by Forbes in the Hortus Woburnensis and the actual specimen of the tree in the park at Woburn, Link formed the conclusion that the Mount Parnassos tree was different from *A. cephalonica*, and in 1841 described his plant as *A. Apollinis*. In 1847 Endlicher accepted the Silver Fir from Cephalonia as a distinct species, *Pinus cephalonica*, Endl., but treated the Mount Parnassos one as a form of the common Silver Fir, *Pinus Abies Apollinis*. The discovery in 1856 of a forest of Silver Fir in the heart of the Peloponnesos by J. Schmidt, then Director of the Athens Botanic Garden, and in 1860 by Heldreitch of another Silver Fir forest on Mount Voidhias, the Panachaicon of the ancients, in Achaia, led to the publication of descriptions of two more species of *Abies* from Greece, *A. reginae Amaliae*, Heldr., and *A. panachaica*, Heldr., though of these the former had in 1858 been referred to by Koch as *A. peloponnesiaca*. In 1851 Wenderoth, when placing the Cephalonian tree in the genus *Picea*, described it as *P. kukunaria*, from the local vernacular name. Since 1860 Silver Firs have been

observed in many localities in Greece, Thessaly and Macedonia, and the synonymy cited by Dr. Stapf reflects well the confusing diversity of opinion which has prevailed as to their relative status, the extreme views varying from that of Heldreich, who has considered that four distinct species are involved, and that of Parlatore, who has not only treated all of them as forms of one tree, but has regarded the Greek Silver Fir as merely a variety of the common Silver Fir of Central Europe. It is clear that with the practical cultivator the view of Parlatore can find no support; the differences between any form of the Greek Silver Fir and *A. pectinata* are such as to induce the conclusion that they cannot be specifically the same as the Silver Fir of our collections. But the view of Heldreich has been found as difficult to accept. Practically all authors who have discussed the subject, whether as the result of study of herbarium material, of examples in gardens, or of wild trees in their natural forest association, either look on the Greek Silver Fir as one rather plastic and unstable species, or believe themselves able to distinguish two definite forms. Among authors who take the latter view there is, however, a difference of opinion as to whether these two Greek Silver Firs be distinct species or only varieties of one; moreover, those authors who recognise two are by no means unanimous as to the areas to be assigned to each. Unger, who was the first to deal with the problem, had made the acquaintance of Napier's original tree in Cephalonia, and of the Mount Parnassos form, *A. Apollinis*, in Euboea; he was satisfied that the two are but local modifications of the same species. Boissier, on the other hand, recognised two species, *A. cephalonica*, confined to the island which gives it this name, and *A. Apollinis*, confined to the mainland of Greece, though there with two varieties, *panachaica* and *reginae Amaliae* respectively. Halácsy, who visited some of the Greek Silver Fir forests, and who probably had more material for study at his disposal than any previous writer, assigned to *A. cephalonica*, in addition to the island of Cephalonia, an area on the mainland from Doris to Attica and in the Peloponnesos from Achaia to Central Arcadia. The rest of the Greek Silver Fir he treated as a slight variety, *Apollinis*, with

an area extending from Thessaly and Epirus to Euboea, and thence to Attica and those parts of the Peloponnesos east of Achaia and east and south of Arcadia. In Attica, therefore, the areas of Halácsy's two varieties overlap, and from his descriptions we gather that the diagnosis of the two is equally uncertain. From true *A. cephalonica*, which has 'acuminate mucronate-pungent' leaves, he separates var. *Apollinis* with leaves more or less 'acute,' adding, however, that he can find no other difference in the living tree, and that among trees of the Mount Parnassos variety he finds intermediates approaching the Cephalonian type; some of the specimens cited under the variety may, he states, perhaps belong rather to the type. The case for the fusion of the two forms, we now know, is even stronger than Halácsy has indicated, for leaves of cone-bearing branches of the Silver Fir from Cephalonia itself are more often 'acute' than 'acuminate and pungent'; on the other hand, juvenile states of the Mount Parnassos tree have leaves quite as pungent as those which were originally observed in the young Cephalonian specimens from which the figures of Loudon and Forbes were drawn. The conclusion arrived at by Unger seems therefore to be fully justified; in the Greek Silver Fir we have to deal with but one somewhat unstable species within which we cannot, so far as existing knowledge goes, distinguish with safety even local races. As cultivated in this country, *A. cephalonica* is one of the most thriving of Firs; an example at Barton, in Suffolk, has attained a height of 100 feet. It likes a deep loamy moist soil and is perfectly hardy. It may be raised from either imported or home-ripened seeds. From other Silver Firs grown in England it is readily distinguished by its radially in place or more or less pectinately arranged leaves which have acute or sharply pointed tips. The tree from which the material for our plate was derived is in the collection of Mr. L. N. Baxendale, Greenham Lodge, Newbury.

DESCRIPTION.—*Tree* up to 100 ft. in height; trunk 3–4 ft. in diameter; bark grey-brown, afterwards breaking into small oblong flakes; branches long, horizontal

or the topmost upcurved; twigs glabrous, at first greenish, at length grey. *Buds* ovoid, rather blunt, $\frac{1}{5}$ in. long, resinous; scales ovate, acute, long persisting at the bases of the twigs. *Leaves* persisting for 7–9 years, linear, usually shortly acute, rarely obtuse or subacute, or cuspidate-pungent, $\frac{2}{3}$–1 in. long, rarely longer, straight, or more or less curved, thickly coriaceous, dark green above with a slightly sunk midrib, beneath with two broad sunk white lines between the midrib and the edges. *Male cones* cylindric, blunt, $\frac{1}{2}$–$\frac{2}{3}$ in. long, deep vinous-purple. *Female cones* solitary or 2–3 together, cylindric, 2–3 in. long, $\frac{2}{3}$–$\frac{3}{4}$ in. thick. *Carpels* in flower spathulate, denticulate at the sides and tip, with a rather marked reflexed or, especially towards the top of the cone, stiffly reflexed cusp. *Ovuliferous scales* in flower as long as the carpels excluding their cusp, much widened from a short broad claw, broader than long, with denticulate edges, thinly rusty velvety at the top. *Cones* when ripe cylindric, blunt or conical, 5–6$\frac{1}{2}$ in. long, 1$\frac{1}{2}$–2 in. thick, brown at times flushed with purple; ripe scales $\frac{2}{3}$–$\frac{3}{4}$ in. long, about 1 in. across, somewhat altered in shape, and rather longer than the carpels exclusive of their cusp. *Seeds* oblong, tawny purple, with a wide oblong truncate wing as long as the body of the seed, about $\frac{2}{3}$ in. long, the wing included.

Figs. 1 and 2, leaves; 3, carpel and ovuliferous scale; 4, ovuliferous scale with seeds; 5, seed:—*all enlarged.*